Instruction Manual for all C Ltd. SCSI Host/Controllers and Hard Drive Systems

Featuring SCSIdos 3.0

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Introduction

Thank you for selecting our product. Your new C Ltd. SCSI Host/Controller is the latest in a series of SCSI host/controllers and is the result of almost three years of field-proven experience by thousands of Amiga users and a continuing research and development by a team of top hardware and software designers who are dedicated to the continuing evolution and support of the product. The product you now own is the culmination of our design efforts to date and is the most feature-packed bug-free high-performance product available for your Amiga. But with the computer world being what it is, you can rest assured that there will be continued refinements, improvements and revisions to our product, and in our effort to provide the best possible products (and support of those products) for our customers, we will offer updates to our customers free whenever possible or at minimal cost when such is required. For example, since the introduction of our first SCSI host/controller we have made numerous upgrades, all 'software only' upgrades were (and will continue to be) posted on our BBS and therefore available at no cost, one major upgrade required a component change (removing and replacing one socketed IC chip) and in this case we offered the required hardware and the software for only $20.00! And, if the customer felt un-easy about doing the swap, we even offered to do the replace the IC chip at our facility at no additional cost except for the postage to get it to us. Additionally, we have customer support personnel that are willing and able to take whatever time is required to insure that you have ALL your questions answered and any problems solved.

IMPORTANT: This manual will cover the set-up and operation of ***ALL*** C Ltd. SCSI Host/Controllers. This will include ***both*** controllers that are purchased separately and those that are purchased as part of complete C Ltd. Hard Drive Systems. Though the vast majority of the information is identical for all controllers in all situations, instructions and/or information that applies to specific situations will be clearly identified.

The manual is divided into sections dealing with various aspects of the set-up and operation of your C Ltd. SCSI host/controller. The first section of this manual is a 'Quick Start' step-by-step walk-through of the set-up of your C Ltd. SCSI host/controller, followed by additional sections that detail the normal operation of your Hard Drive system and the instructions for the various programs that are used in support of the Hard Drive. A Technical Reference Manual is also provided thatsections will deal with more technical information including theory of operation, trouble-shooting and additional advanced topics.

We intend to continue to improve both the manual and the product as well, so if you find an area of this manual that needs improving, or functions or features that you would like to see covered in more detail, please let us know. You can reach us using any of the following methods:

Telephone:	(316) 267-0202
FAX:	(316) 267-0111
BBS:	(316) 267-1222
CIS:	C Ltd Tech Support in the Amiga Forum.
U.S. Mail:	C Ltd. | 723 E. Skinner | Wichita, KS | 67211

Acknowledgements, Credits, Trademarks and Copyrights

C Ltd. would like to thank the following for their outstanding efforts:

To Betsey and Jackie for their help in every way imaginable.

To Breck Ricketts and Wayne Miller for creating their own brand of excellence!

To Steve Tibbett for the MLed and FormatHD intuition user interfaces.

To our dealers and customers (literally hundreds of them) who helped us understand what they wanted as well as what they needed.

Copyright and Trademark Notices

The Boot disk provided with your C Ltd. SCSI host/controller contains the current version of Commodore-Amiga's WorkBench 1.3™. Various additional software provided by C Ltd that is necessary to get your SCSI devices running with your system, along with some public domain utilities are on the disk as well. All of the programs on the Boot disk (except those listed below) are Copyrighted by Commodore® and are provided for your use under a license agreement between Commodore-Amiga and C Ltd. All Copyrighted programs are provided for your use only and should not be duplicated for other than your personal use. The subject of the violation of Copyright laws has been beaten to death and we will not waste your time or ours with any additional comments here.

Programs on the C Ltd. Boot disk that are Copyrighted by C Ltd. or authorized for use by C Ltd. are:

Devs:CLtd.device
Devs:DevSetup
Devs:DevInstall
Devs:HardDisk.driver
Devs:SCSI.handler
C:DefDisk
C:Less
Docs: ALL FILES
HDUtils: ALL FILES
MLEd: ALL FILES

In addition, all written documentation provided with this product was written by E.J. Lippert II and is Copyrighted by C Ltd. with all rights reserved.

Commodore, Amiga, AmigaDOS and WorkBench are trademarks or registered trademarks of Commodore Business Machines.
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CygnusEd is a trademark of ASDG, Inc.
C Ltd., LazerXpress, SCSIdos and SCSInet are trademarks of C Ltd.

C Ltd. SCSI Host/Controller Limited Guaranty

Except for the limitations listed below, our guaranty to you is simple, for one year from the date of the purchase of any C Ltd. product, if it fails to operate properly for any reason other than willful, intentional abuse of the product or un-authorized modification of the product, you may return the product to us and we will replace or repair it at no cost to you. The cost of returning the product to our repair facility will be your expense, We will return the product to you by U.P.S. or U.S.P.S. at our expense. (Overnight return service is available, but you will have to pay the difference between it and the normal shipping charges.)

Limitations to the C Ltd. Guaranty

***'No-Fault'* Product Liability Limitation:**

C Ltd. will not be held liable for any damages to other equipment which are, or could have been, caused by caused by any C Ltd. product, but C Ltd. will repair or replace any C Ltd. product that may be damaged by any associated equipment.

Notice to Other Manufacturers: If all manufacturers took the above ***'No-Fault'*** position in their product guaranties it would put an absolute end to the arguments about who did what to whom and would assure the customer of speedy repairs and continuity of service from their systems. The Hard Drive systems that we market are among the most expensive components in most systems (in many cases, costing more than the computer itself) so if we are willing to make this promise to our customers, shouldn't you!

***'Loss of Data'* Product Liability Limitation:**

C Ltd. will in no way be held responsible or liable for any loss of programs or data for any reason at any time. We will, at your expense, attempt to recover data.

Hard Disk Mechanism Limited Guaranty

The actual Hard Disk Drive Mechanisms and SCSI to ST-506 device controllers supplied by C Ltd. as a part of C Ltd.'s complete Hard Drive Systems are manufactured and guaranteed by several companies other that C Ltd. The terms, conditions and durations of the guaranties for each of these manufacturers varies. C Ltd. will act as an agent for its customers in securing the repair or replacement of defective mechanisms within the terms, conditions and durations of the guaranties for each of these manufacturers. Generally, the guaranty period for the manufacturers products used by C Ltd. is as shown below, but because this information is subject to change without our knowledge or control, we will not be held responsible for its accuracy.

Adaptec - 90 days parts and labor
Fujitsu - 90 days parts and labor
Hewlett-Packard - 5 years parts and labor
Kaloc - 90 days parts and labor
Maxtor - 1 year parts and labor
Micropolis - 1 year parts and labor
Miniscribe - 90 days parts and labor
Okidata - 1 year parts and labor
Omti - 90 days parts and labor
Seagate - 90 days parts and labor

General Precautions When Dealing With Electronic Equipment

Please take the following basic precautions (which should be taken when dealing with any electronic circuitry or components) before attempting to install or remove any C Ltd. products or components. This warning applies to **ALL** hardware components including disk drives, controllers, adapters and even (especially) cables and wiring.

1. ALWAYS turn off and **UN-PLUG** your computer and all devices (like printers etc.) that are attached to it before attempting to plug-in or unplug anything from your system.

2. Eliminate any static electricity built up in your body by touching anything metal that is grounded. If possible, use a grounding strap or wire attached to a good ground (such as a water pipe) at one end, and at the other, attached to metal watchband, metal bracelet, or ring that you are wearing.

3. If Possible, reduce the chances of static build up by working on an un-carpeted area or, if possible, on a grounded anti static mat. (You should also use anti-static spray in carpeted areas, and don't forget to spray your clothes. By the way, more that one kitty-cat has wound up homeless as a result of being a very excellent source of static electricity!)

NOTE: One part Downy fabric softener to seven parts water in a spray bottle will make an excellent anti-static agent. [Ed]

C Ltd. SCSI QUICK-START Instructions.

Setting up your Amiga with the C Ltd. SCSI Host/Controller.

We know that you are eager to start using your new Hard Drive, that's why we put this section first. Initial set-up of the C Ltd. Hard Drive and SCSI Host/controller is very simple and should take no more than a few minutes. (If you are installing a hard drive that was purchased separately, the installation and set-up will be considerably more time consuming because the hard drive will have to be formatted. All of the necessary procedures are supplied, but they will take some time to complete.) The next few pages are dedicated to helping you to get your system on line as quickly as possible and will assume that you are setting up a basic C Ltd. SCSI Host/Controller and one Hard Disk Drive. If you have additional hardware (additional Hard Disk Drives, or other SCSI devices) that will be attached to the C Ltd. SCSI Host/controller, **we strongly suggest that you follow the instructions in this section and set up the basic system first.** Then after the basic system is up and running, refer to the C Ltd. SCSI Device Technical Reference Manual for instructions on expanding the basic system. There is additional important information in the C Ltd. SCSI Device Technical Reference Manual and you should read it all at some point, but it is not necessary right now. We realize that you want to get your new system running as soon as possible, so we have made the process as simple as we could.

There are only a few instructions that you **MUST** follow, but you must follow them exactly and completely. The instructions are in a step-by-step instruction format, the technical information and explanations are left for the Technical Reference Manual. Please read the following few pages carefully, follow the instructions exactly and check off each step, as it is completed, in box provided. This will be the ***fastest*** and the ***safest*** way to get your system running.

☐ Make a back-up copy of C Ltd. SCSIdos 3.0 disk. The set-up and installation will cause data to be written to the disk provided with your C Ltd. SCSI Host/Controller, so it is possible that a faulty disk drive or a system crash could wipe-out important (un-recoverable) data. None of the disks provided is copy-protected in any way so they can be copied by any means that you desire. (**Note:** If you use the Amiga's WorkBench {Icon-to-Icon} diskcopy function, be sure that you rename the disks to their original names by removing the *'copy of'* wording that is automatically prefixed to the target disk's name during the copy procedure. PS. Don't forget to remove the space after the *'of'* and in front of the first letter of the disk's real name.)

☐ Insure that the C Ltd. SCSI Host/Controller that you have is the correct version for Your Amiga. There are five versions of the C Ltd. SCSI Host/Controller. The SCSI/2000, SCSI/2506M and SCSI/2506R are for the Amiga A-2000, the SCSI/1000 is for the Amiga A-1000 and the SCSI/500 is for the Amiga A-500.)

☐ *If you have purchased a **COMPLETE** C Ltd. Hard Drive system,* (ie. C Ltd. SCSI Host/Controller with a C Ltd.Hard Drive) compare the serial number on the C Ltd. SCSIdos 3.0 Diskette with the serial number on the underside of your Hard Drive. **IF THE TWO SERIAL NUMBERS DO NOT MATCH, call our customer service department immediately.**

☐ **Make sure that ALL electrical power is turned OFF to your Amiga and to your Hard Drive. Attempting to complete this installation with ANY power on WILL cause damage to your Amiga and/or any items being connected to it.**

☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.

☐ Locate the section titled *'SCSI Host/Controller Installation and Testing'* starting at page 7 of this Instruction Manual, install the C Ltd. SCSI Host/Controller on/in your Amiga Computer as outlined therein and then return to this section.

☐ *If you have purchased a* **COMPLETE** *C Ltd. Hard Drive system,* locate the section titled *'C Ltd. Hard Drive Installation and Testing'* starting at page 11 in this Instruction Manual and install the C Ltd. Hard Drive on/in your Amiga Computer as outlined therein.

☐ *If you have a hard drive that was NOT purchased as part of a* **COMPLETE** *C Ltd. Hard Drive system,* locate the section titled *'Generic Hard Drive Installation and Testing'* starting at page 17 in this Instruction Manual and install and configure the hard drive on/in your Amiga Computer as outlined therein.

If you have completed the installation and testing and your hard drive is operating properly, you may now either take a fun break and try some of the other tests and demonstrations as described in the *'Using your Hard Drive'* section, or if you have additional SCSI devices that you wish to install you may wish to read the information in the Technical Reference Manual for instructions for setting-up the particular device.

C Ltd. SCSI Host/Controller Installation

Installing the C Ltd. SCSI Host/Controller is a relatively simple task, but it is possible to do it improperly. Please follow the instructions supplied to insure proper installation of your C Ltd. SCSI Host/Controller. There are different C Ltd. SCSI Host/Controllers for each model (A-500, A-100 and A-2000) of the Amiga computer. Follow the instructions below which will guide you through the proper installation and testing procedures for the particular computer that you own.

- ☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.
- ☐ **Turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before attempting to install the C Ltd. SCSI Host/Controller.**
- ☐ If you are installing a C Ltd. SCSI Host/Controller on an **Amiga 500** please turn to page 8 for specific instructions and then return to this section.
- ☐ If you are installing a C Ltd. SCSI Host/Controller on an **Amiga 1000** please turn to page 9 for specific instructions and then return to this section.
- ☐ If you are installing a C Ltd. SCSI Host/Controller on an **Amiga 2000** please turn to page 10 for specific instructions and then return to this section.
- ☐ Now, power-up and boot your Amiga using your standard Amiga WorkBench disk (and KickStart disk for Amiga 1000 owners) to insure that your C Ltd. SCSI Host/Controller has been installed properly and is operating correctly.
- ☐ If your Amiga booted-up properly, **TURN OFF YOUR AMIGA** and re-install any memory cards or other expansion devices that were removed earlier. Be sure to follow the instructions provided by the manufacturer of the device so as to assure proper installation.
- ☐ Again, power-up and boot your Amiga, using your standard Amiga WorkBench disk (and KickStart disk for Amiga 1000 owners) to insure that your C Ltd. SCSI Host/Controller and all other expansion cards have been installed properly and are operating correctly.
- ☐ If your Amiga Booted-up normally with all devices installed, **turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before returning to page 6 and continuing on with the next step.**

IMPORTANT: If your computer fails to initialize properly during any of the above steps, contact your dealer or C Ltd. immediately for assistance.

C Ltd. SCSI Host/Controller Installation For Amiga A-500 Owners

Be sure that you have read and are following the precautions provided on the page 4 of this manual. Carefully follow the instructions provided here for easy and proper installation of your Host/Controller.

☐ **Be sure that all power is off to your computer and any and all devices that are attached to it and that they are un-plugged.**

☐ If you currently have any expansion devices (memory cards, drawing tablets, etc.) connected to the (86 pin) expansion bus at the left of your keyboard, disconnect them from the computer before installing and testing the C Ltd. SCSI Host/Controller.

☐ Carefully remove the plastic cover plate that covers the Amiga's expansion port. This cover is located on the left side of your Amiga at the bottom edge, slightly to the front of center. (See your Amiga instruction manual for additional details about the location of and access to the expansion port.) Remove the cover by pulling it straight away from the computer.

☐ Locate and examine the edge of the long card edge connector that extends through the expansion port opening on the left side of the Amiga.

☐ Locate and examine the long edge of the circuit board that extends through the slot in the side of the case of the C Ltd. SCSI Host/controller.

☐ Orient the C Ltd. SCSI Host/Controller so that it is parallel to the left side of your Amiga with the 25 pin connector pointed toward the rear of the Amiga and the extended circuit board pointed toward the computer.

☐ Carefully align the slot of the edge card connector on the Amiga with the exposed edge of the C Ltd. SCSI Host/controller circuit board and press the C Ltd. SCSI Host/controller firmly into position.

☐ Visually inspect the computer and the C Ltd. SCSI Host/controller to assure that a proper fit has been made. A proper fit will leave the C Ltd. SCSI Host/controller firmly attached, with metal case of the C Ltd. SCSI Host/controller parallel to and lightly touching the plastic case of the Amiga, and the 25 pin connector at the rear.

IMPORTANT NOTE: If you have additional devices that you wish to plug into the 86 pin expansion bus, you should remove the two screws that hold on the cover plate on the left side of the C Ltd. SCSI Host/Controller which will expose the 86 pin connector for additional expansion. **DO NOT** connect any additional expansion devices to the 86 pin connector at this time!

RETURN TO PAGE 7 FOR ADDITIONAL INSTRUCTIONS.

C Ltd. SCSI Host/Controller Installation For Amiga A-1000 Owners

Be sure that you have read and are following the precautions provided on the page 4 of this manual. Carefully follow the instructions provided here for easy and proper installation of your Host/Controller.

- ☐ **Be sure that all power is off to your computer and any and all devices that are attached to it and that they are un-plugged.**
- ☐ If you currently have any expansion devices (memory cards, drawing tablets, etc.) connected to the (86 pin) expansion bus at the right of your Amiga, disconnect them from the computer before installing and testing the C Ltd. SCSI Host/Controller.
- ☐ Carefully remove the plastic cover plate that covers the Amiga's expansion port. This cover is located on the right side of your Amiga slightly rear of the mouse and joystick ports. (See your Amiga Instruction Manual for additional details about the location and access to the expansion port.) Remove the cover by pulling it straight away from the computer.
- ☐ Locate and examine the edge of Amiga's circuit board that extends through the expansion port opening on the right side of the Amiga.
- ☐ Locate and examine the long edge card connector that extends through the slot in the side of the case of the C Ltd. SCSI Host/controller.
- ☐ Orient the C Ltd. SCSI Host/Controller so that it is parallel to the right side of your Amiga with the 25 pin connector pointed toward the rear of the Amiga and the edge card connector pointed toward the computer.
- ☐ Now, carefully align the slot of the edge card connector on the Amiga with the exposed edge of the C Ltd. SCSI Host/controller circuit board and press the C Ltd. SCSI Host/controller firmly into position.
- ☐ Visually inspect the computer and the C Ltd. SCSI Host/controller to assure that a proper fit has been made. A proper fit will leave the C Ltd. SCSI Host/controller firmly attached, with metal case of the C Ltd. SCSI Host/controller parallel with and lightly touching the plastic case of the Amiga, and the 25 pin connector at the rear.

IMPORTANT NOTE: If you have additional devices that you wish to plug into the 86 pin expansion bus, you should remove the two screws that hold on the cover plate on the right side of the C Ltd. SCSI Host/Controller which will expose the 86 pin connector for additional expansion. (Additional expansion will require an APTB pass-thru adapter.) **DO NOT** connect any additional expansion devices to the 86 pin connector at this time!

RETURN TO PAGE 7 FOR ADDITIONAL INSTRUCTIONS.

C Ltd. SCSI Host/Controller Installation For Amiga A-2000 Owners

Be sure that you have read and are following the precautions provided on the page 4 of this manual. Carefully follow these instructions to insure the proper installation of your Controller.

☐ **Be sure** that all power is off to your computer and any and all devices that are attached to it. **Unplug your Amiga A-2000 from the wall outlet** to insure that there is no possibility of accidental damage to the computer, the Controller or to **YOU!**

☐ Carefully remove the metal case of your A-2000 following the precautions and instructions provided by Commodore.

☐ Orient the computer so that the front of the computer is to your right hand side. Locate and examine the row of six 100 pin edge card connectors located on the Amiga's circuit board. (There is also a seventh edge card connector that is shorter and has only 86 contacts, this connector is reserved of addition of a co-processor card and should be ignored for the duration of these instructions.)

☐ Locate the 'bright metal' cover plates at the rear (to your left) of the computer and find the one that is directly behind (to the left of) the 100 pin connector that is the farthest away from you. Using a small cross-point screwdriver, remove (and save) the single screw that holds the cover plate in place and remove the cover plate.

☐ Pick up the C Ltd. SCSI Host/Controller and orient it so that the 25 pin connector is toward your **LEFT** hand side and so that the component side of the circuit board is facing **AWAY** from you.

☐ Carefully align the front (to your right) edge of the C Ltd. SCSI Host/Controller with the plastic guide slot located on the inside of the front of your Amiga. Line up the Controller so that it the 'bright metal' cover plate at the rear (to your left) of the Controller is lined up with the empty space created by the removal (in step 4) of the original cover plate and gently slide the Controller down until the Controller's lower edge makes contact with the Amiga's 100 pin edge card connector.

☐ Now, carefully align the slot of the edge card connector on the Amiga with the protruding edge of the C Ltd. SCSI Host/Controller circuit board and press the C Ltd. SCSI Host/controller firmly into position.

☐ Visually inspect the computer and the C Ltd. SCSI Host/controller to assure that a proper fit has been made. A proper fit will leave the C Ltd. SCSI Host/controller firmly attached, with front edge of the card retained by the plastic guide on the front of the Amiga and the 'bright metal' cover plate properly positioned at the rear of the computer.

☐ Re-install the retaining screw that secures the 'bright metal' cover plate at the rear of the A-2000, replace the case on the A-2000 following the manufacturer's instructions and return to page 7 for additional instructions.

C Ltd. Hard Drive Installation and Testing

The actual installation and connection of your C Ltd. Hard Drive is the final step in the set-up of your system. Assuming that you have come this far successfully, you have only a few steps left to complete before you will be able to enjoy the fruits of your labor. Please don't get too excited and *rush* these last few steps as it is very important that you continue to follow the instructions carefully. There are two types of complete C Ltd. Hard Drive Systems, internal and external. **ALL** systems supplied for Amiga A-500 and A-1000 computers will include an external type Hard Drive which is supplied with an enclosure that houses the hard drive mechanism, a cooling fan, a 110/220v power supply and in some cases an Adaptec or Omti SCSI/ST-506 device controller. Systems supplied for Amiga A-2000 computers can include either an external hard drive (as described above) or an internal hard drive mechanism which will consist of only the hard drive mechanism itself and the proper cables to connect it to the C Ltd. SCSI Host/Controller.

☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.

☐ **Turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before attempting to install the C Ltd. SCSI Host/Controller.**

☐ If you are installing an **external** hard drive system, please turn to page 13 for additional instructions.

☐ If you are installing an **internal** hard drive system, please turn to page 14 for additional instructions.

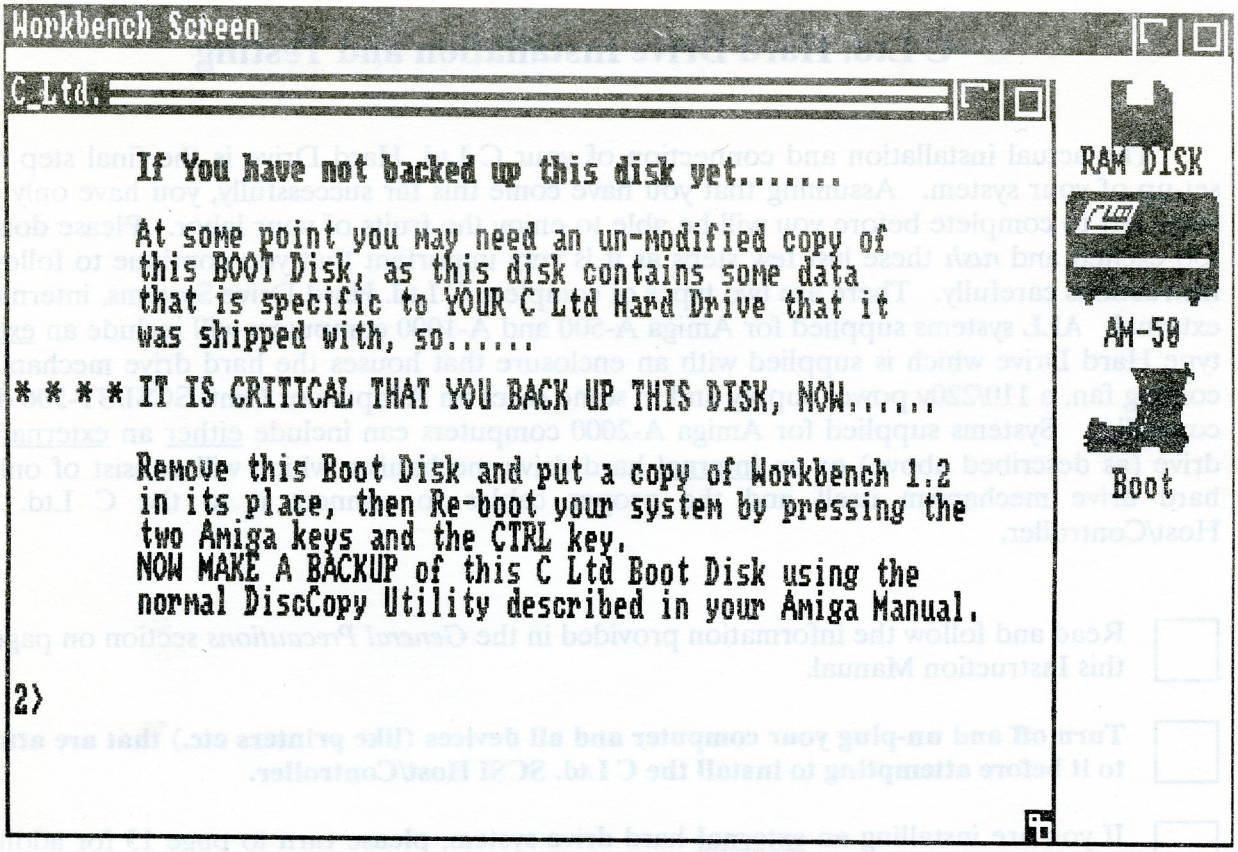
☐ Re-connect all power cables to all components, and power up the components in order, first your monitor, next any other components (printers, audio systems, etc.) connected to your system, next if your system includes an external hard drive turn it on, and finally turn on your computer.

☐ If you have an Amiga A-1000, wait until the *'Insert KickStart'* screen appears, then insert your KickStart disk.

☐ Wait until the *'Insert WorkBench'* screen appears, then insert your **back-up copy** of the C Ltd. SCSIdos 3.0 diskette.

☐ If the system is working properly, after about 10 to 15 seconds of floppy drive activity, the hard drive should come to life and shortly thereafter you should be presented with a screen as shown on the following page.

☐ If your system booted-up as described above then your installation was successful and you are done! Please return to page 6 for your final instructions.


Workbench Screen
C_Ltd.
If You have not backed up this disk yet.....
At some point you may need an un-modified copy of this BOOT Disk, as this disk contains some data that is specific to YOUR C Ltd Hard Drive that it was shipped with, so.....
* * * * IT IS CRITICAL THAT YOU BACK UP THIS DISK, NOW.....
Remove this Boot Disk and put a copy of Workbench 1.2 in its place, then Re-boot your system by pressing the two Amiga keys and the CTRL key.
NOW MAKE A BACKUP of this C Ltd Boot Disk using the normal DiscCopy Utility described in your Amiga Manual.
2>
RAM DISK
AM-50
Boot

Startup Screen

About the C Ltd. Startup-Sequence:

The Startup-Sequence supplied on your C Ltd. SCSIdos 3.0 'Boot' disk will execute only the commands necessary to mount and initialize the hard drive, then it passes control to the Hard Drive by executing the Startup-sequence that is in the 'S' directory of the Hard Drive, which then performs all additional instructions. This is done to make the boot process as fast as possible, the fewer instructions actually executed from the floppy the better. If you want to add additional instructions to the Startup-sequence, you should add them to the Startup-sequence in the 'S' directory on the Hard Drive, not on the floppy, in order to keep the startup as fast as possible.

When startup is complete, as shown in the screen above, both the Amiga WorkBench and an Amiga CLI screen are active and available. We have found this to be most effective as the user now can use either interface or a combination of both as desired.

NOTE: The CLI window show above is opened during the execution of the Startup-sequence on the Hard Drive by the line "*newcli con:0/16/540/183/C Ltd. from dh0:s/typenote*" You can eliminate the message by editing the file and deleting the words "*from dh0:s/typenote*" and you can change the window size and location by changing the values that follow the colon.

Setting-Up An External C Ltd. Hard Drive

All external C Ltd. Hard Drives are set-up exactly the same way and this final step in the set-up of your system is the easiest of them all. Please remember that your hard drive is a delicate instrument deserving of being handled with tender loving care.

☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.

☐ **Turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before attempting to install the C Ltd. Hard Drive.**

☐ Be sure to select a location for your Hard Drive that is free of vibrations and not subject to physical shocks. Do not set the unit on the same platform as a *'hammer banger'* daisy wheel printer or other such device, or where it could be subject to being bumped or kicked. If, in order to have a suitable location, you have to locate the Hard Drive farther away from your computer than the supplied cable allows, contact your dealer for an extension cable. You can also use a standard 'MacIntosh' SCSI extension cable or you can order an extension cable by calling our Customer Service Department.

☐ Position the Hard Drive in the desired location and connect the AC power cord (supplied with the Hard Drive) to the drive and into the wall.

☐ Use the switch at the rear of the case to turn on the Hard Drive. Verify that the drive starts-up and that the L.E.D. in the front panel flashes on and off for a few seconds, then goes out. Also verify that the internal fan is operational by feeling for a slight draft out the rear of the case. **Now, TURN OFF THE HARD DRIVE!**

☐ With the 25 pin to 50 contact SCSI cable (supplied with the Hard Drive) connect the smaller (25 pin) connector to the matching 25 pin connector on the rear of the C Ltd. SCSI Host/Controller and secure the connection with the screws on the connector. Attach the larger 50 contact connector to *either* of the two 50 contact connectors on the rear of the Hard Drive. Secure the connector using the clips provided on the Hard Drive's connector.

☐ Be sure that now and forever more, no objects, papers, rags or whatever shall be allowed to interfere with or restrict any air flow through the air vents on the bottom, sides or rear of the Hard Drive. **DO NOT** put the Hard Drive on a carpeted surface.

The set-up of your Hard Drive is now complete, please return to page 10 to continue with the testing phase of your Hard Drive system.

Setting-Up An Internal C Ltd. Hard Drive

C Ltd. internal Hard Drives are **ONLY** supplied for use with Amiga A-2000 computers, so these instructions will assume that you will be installing the drive in an Amiga A-2000. There are two types of internal Hard Drives that are supplied by C Ltd. One type (referred to as an imbedded SCSI Hard Drive) has an SCSI device controller built into the Hard Drive's own electronics package and can be identified by the presence of a 50 pin connector (consisting of two parallel rows of 25 pins each) at the rear of the Hard Drive's circuit board. The second type (referred to as an ST-506 Hard Drive) requires an external SCSI to ST-506 device controller in order to function with a C Ltd. SCSI Host/Controller. The SCSI to ST-506 device controller is mounted on the C Ltd. SCSI/2000 Host/Controller as a *'piggy-back'* circuit board and this system can be identified by the presence of the *'piggy-back'* circuit board on the C Ltd. SCSI/2000 Host/Controller and by the presence of two connectors, one 34 pin and one 20 pin, on the Hard Drive's circuit board.

Either of the above types of drives is also available in either 5.25" or 3.5" wide versions (called *'form-factor'*) for installation in either of the Amiga's available Hard Drive mounting bays. If you are in doubt as to the form-factor of the drive you have, get out a ruler and measure it.

The instructions below will specifically outline procedures that are unique to either type or size of Hard Drive. Please remember that your hard drive is a delicate instrument deserving of being handled with tender loving care.

- ☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.
- ☐ **Turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before attempting to install the C Ltd. Hard Drive.**
- ☐ **Following the instructions provided with your Amiga A-2000, remove the cover from your computer and position the computer so that you are directly in front of it.**
- ☐ Determine the form-factor of the Hard Drive that you are installing. If you are installing a 5.25" drive, it will be located in the drive bay directly below the floppy drive that is now in place in your Amiga A-2000. If you are installing a 3.5" drive, it will be located in the drive bay to the immediate left of the floppy drive that is now in place in your Amiga A-2000. All future references to a *'drive bay'* will assume that you are working with the correct one!

☐ If you are installing an ***imbedded SCSI Hard Drive,*** thread the 50 conductor flat ribbon cable that is attached to your C Ltd. SCSI Host/Controller through the drive bay from the rear of the bay and out the front. (If the 50 conductor cable somehow became detached from the C Ltd. SCSI Host/Controller, you should plug it into the C Ltd. SCSI Host/Controller's 50 pin connector which is located about 1" from the rear of the circuit board. **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE SCSI HOST/CONTROLLER'S CONNECTOR. THE LOCATION OF PIN ONE IS PRINTED ON THE CIRCUIT BOARD OF THE SCSI HOST/CONTROLLER.**

☐ If you are installing an ***ST-506 Hard Drive,*** thread the 34 conductor and the 20 conductor flat ribbon cables that are attached to your SCSI to ST-506 device controller (which is the *'piggy-back'* circuit board attached to the C Ltd. SCSI Host/Controller) through the drive bay from the rear of the bay and out the front. (If either of the cables somehow became detached from the SCSI to ST-506 device controller, you should plug it into the appropriate connector, the 34 conductor cable only has one place where it can go, but the 20 conductor cable must be connected to the connector marked as 'J0'. Both of the connectors are located at the rear of the SCSI to ST-506 device controller's circuit board. **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE SCSI TO ST-506 DEVICE CONTROLLER'S CONNECTOR. THE LOCATION OF PIN ONE IS PRINTED ON THE CIRCUIT BOARD OF THE SCSI TO ST-506 DEVICE CONTROLLER.**

☐ If you are installing an ***imbedded SCSI Hard Drive,*** locate the 50 pin connector on the Hard Drive, and determine the location of PIN 1 of the connector. The location of PIN 1 can be determined by looking on the Hard Drive's printed circuit board for appropriate markings, or from the instruction manual supplied by the manufacturer of the Hard Drive. (Note: If the manufacturer supplied a manual to us, we will have included it with the system, some do, but some don't.) Connect the 50 conductor cable to the Hard Drive, but **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE HARD DRIVE'S CONNECTOR.**

☐ If you are installing an ***ST-506 Hard Drive,*** locate the 34 conductor and the 20 conductor connection points at the rear of the Hard Drive. Connect the cables to the appropriate connectors, but **BE ABSOLUTELY POSITIVE THAT THE CABLES ARE CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE HARD DRIVE'S CONNECTOR. THE LOCATION OF PIN ONE SHOULD BE CLEARLY PRINTED ON THE CIRCUIT BOARD OF THE HARD DRIVE.**

- [ ] Gently slide the Hard Drive mechanism into the appropriate drive bay. DO NOT use the mounting screws to mount the drive at this time.

- [ ] Locate the power supply wiring harness that is laying inside your computer between the drive bays and the power supply cage. The harness consists of four wires (Red, Black and White/White) with several four pin connectors on it. Connect one of the four pin connectors onto the matching four pin receptacle on the rear of the Hard Drive mechanism. These connectors are 'keyed' so they will only go on one way. If it don't fit don't force it!

- [ ] If you are installing an ***ST-506 Hard Drive,*** connect one of the remaining four pin connectors on the power supply wiring harness to the matching four pin receptacle on the SCSI to ST-506 device controller that is mounted on the C Ltd. SCSI Host/Controller.

- [ ] Using the four mounting screws (provided with the Hard Drive) mount the Hard Drive into the appropriate drive bay.

- [ ] Your Amiga A-2000 has a green Hard Drive Activity L.E.D. located below the red power L.E.D. indicator at the left front of the computer. To connect this indicator, locate the Hard Drive L.E.D. wiring harness that comes from the Hard Drive L.E.D. indicator. This wiring harness consists of a red and a black wire, terminated with a THREE conductor female connector. Locate the two pin connector at the extreme top edge, about in the middle of the C Ltd. SCSI Host/Controller. connect the THREE conductor female connector so that the two connections that are connected to the red and black wires contact the two pins on the C Ltd. SCSI Host/Controller, with the third (unused) contact pointed toward the rear of the computer.

- [ ] Take the cover from your Amiga A-2000 and remove the cover plate from the front panel so that the Hard Drive will be visible through the front panel.

- [ ] Now put the cover back on your computer, return to page 11 and complete the final steps in the testing of your system.

Generic (non-C Ltd.) Hard Drive Installation and Testing

The actual installation and connection of your C Ltd. Hard Drive is the next step in the set-up of your system. Assuming that you have come this far successfully, you have only a few steps left to complete before you will be able to enjoy the fruits of your labor. Please don't get too excited and *rush* these last few steps as it is very important that you continue to follow the instructions carefully. There are two types of Hard Drive Systems that can be connected to your Amiga, internal and external. **ALL** systems for Amiga A-500 and A-1000 computers must be of the external type Hard Drive and it is your responsibility to provide a suitable enclosure to house the hard drive mechanism and a power supply capable of providing sufficient output. Systems for Amiga A-2000 computers can be of either the external hard drive type (as described above) or an internal hard drive mechanism which will consist of only the hard drive mechanism itself and the proper cables to connect it to the C Ltd. SCSI Host/Controller.

- ☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.
- ☐ **Turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before attempting to install the C Ltd. SCSI Host/Controller.**
- ☐ If you are installing an **external** hard drive system, please turn to page 18 for additional instructions.
- ☐ If you are installing an **internal** hard drive system, please turn to page 20 for additional instructions.
- ☐ Re-connect all power cables to all components, and power up the components in order, first your monitor, next any other components (printers, audio systems, etc.) connected to your system, next if your system includes an external hard drive turn it on, and finally turn on your computer.
- ☐ If you have an Amiga A-1000, wait until the *'Insert KickStart'* screen appears, then insert your KickStart disk.
- ☐ Wait until the *'Insert WorkBench'* screen appears, then insert your **back-up copy** of the C Ltd. SCSIdos 3.0 diskette.
- ☐ Now, turn to page 23 for instructions on the proper formatting and software configuration procedures for your Hard Drive.
- ☐ Re-start your computer, if the system is working properly, after about 10 to 15 seconds of floppy drive activity, the hard drive should come to life and shortly thereafter you should be presented a screen as shown on the page 12.
- ☐ If your system booted-up as described above then your installation was successful and you are done! Please return to page 6 for your final instructions.

Setting-Up An External Generic Hard Drive

All external Hard Drives will require a case and power supply and the proper connectors or cables to connect them to the C Ltd. SCSI Host/Controller. Additionally, if you are setting-up an ST-506 type Hard Drive, you will need to supply either an Adaptec ACB-4000 or ACB-4070, or an OMTI 3520 or 3527 SCSI to ST-506 hard drive controller. All of these controllers and the cables required are available from C Ltd., contact your dealer or call our Customer Service department for assistance in the selection of the proper SCSI to ST-506 hard drive controller for your system. Please remember that your hard drive is a delicate instrument deserving of being handled with tender loving care.

☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.

☐ **Turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before attempting to install the C Ltd. Hard Drive.**

☐ Be sure to select a location for your Hard Drive that is free of vibrations and not subject to physical shocks. Do not set the unit on the same platform as a *'hammer banger'* daisy wheel printer or other such device, or where it could be subject to being bumped or kicked. If, in order to have a suitable location, you have to locate the Hard Drive farther away from your computer than the supplied cable allows, contact your dealer for an extension cable.

☐ Position the Hard Drive in the desired location and connect the AC power cord (supplied with the Hard Drive) to the drive and into the wall.

☐ Use the switch at the rear of the case to turn on the Hard Drive. Verify that the drive starts-up and that the L.E.D. in the front panel flashes on and off for a few seconds, then goes out. Also verify that the internal fan is operational by feeling for a slight draft out the rear of the case. **Now, TURN OFF THE HARD DRIVE!**

☐ There are two types of cables that can be used to connect your hard drive to the C Ltd. SCSI Host/Controller. One type is the standard SCSI 50 conductor ribbon cable which is a flat ribbon of wires about 3" wide with long thin female connectors at either end. The other type is the *'pseudo-standard'* SCSI cable (a round shielded cable with a 25 pin connector on one end and a 50 contact connector on the other) which has been established by Apple computers for the MacIntosh line of SCSI peripherals. The C Ltd. SCSI Host/Controller provides for the use of either of these types of connectors. The cable provided with C Ltd. SCSI Host/Controller for the Amiga A-500 and A-1000 is of the Macintosh *'pseudo-standard'* SCSI type, but you can use the other type if you supply your own cable, or contact C Ltd. Customer Service for the proper cable.

☐ If you are using the *'pseudo-standard'* SCSI cable, connect the smaller (25 pin) connector to the matching 25 pin connector on the rear of the C Ltd. SCSI Host/Controller and secure the connection with the screws on the connector. Attach the larger 50 contact connector to a matching 50 contact connectors on the Hard Drive. Secure the connector using the clips provided on the Hard Drive's connector.

☐ If you are using the 50 conductor ribbon type cable, the connector for this cable in inside the case of the C Ltd. SCSI Host/Controller (you will need to remove the metal case from the controller to get access to this connector) at the rear of the circuit board, just in front of the 25 pin connector. Connect the cable to the C Ltd. SCSI Host/Controller and to the Hard Drive, but **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE SCSI HOST/CONTROLLER'S CONNECTOR. THE LOCATION OF PIN ONE IS PRINTED ON THE CIRCUIT BOARD OF THE SCSI HOST/CONTROLLER,** and **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE HARD DRIVE'S (OR SCSI TO ST-506 HARD DRIVE CONTROLLER'S) CONNECTOR.**

☐ Be sure that now and forever more, no objects, papers, rags or whatever shall be allowed to interfere with or restrict any air flow through the air vents on the bottom, sides or rear of the Hard Drive. **DO NOT** put the Hard Drive on a carpeted surface.

The set-up of your Hard Drive is now complete, please return to page 17 to continue with the configuration and testing phase of your Hard Drive system.

Setting-Up An Internal Generic Hard Drive

Internal Hard Drives can **ONLY** be used with Amiga A-2000 computers, so these instructions will assume that you will be installing the drive in an Amiga A-2000. There are two types of internal Hard Drives that can be used with the C Ltd. SCSI Host/Controller. One type (referred to as an imbedded SCSI Hard Drive) has an SCSI device controller built into the Hard Drive's own electronics package and can be identified by the presence of a 50 pin connector (consisting of two parallel rows of 25 pins each) at the rear of the Hard Drive's circuit board. This type of hard drive should be used with the C Ltd. **SCSI/2000** Host/Controller. The second type (referred to as an ST-506 Hard Drive) requires an external SCSI to ST-506 device controller in order to function with a C Ltd. SCSI Host/Controller. This type of hard drive can be identified by the presence of two connectors, one 34 pin and one 20 pin, on the Hard Drive's circuit board. You must use either a C Ltd. **SCSI/2506M** or **SCSI/2506R** Host/Controller with this type of drive. Use the C Ltd. SCSI/2506M Host/Controller with **MFM** type ST-506 hard drives and use the C Ltd. SCSI/2506**R** Host/Controller with **RLL** type ST-506 hard drives. **NOTE:** The SCSI to ST-506 device controller is included with and pre-mounted on the C Ltd. SCSI/2506M and SCSI/2506R Host/Controllers as a *'piggy-back'* circuit board.

Either of the above types of drives is also available in either 5.25" or 3.5" wide versions (called *'form-factor'*) for installation in either of the Amiga's available Hard Drive mounting bays. If you are in doubt as to the form-factor of the drive you have, get out a ruler and measure it.

The instructions below will specifically outline procedures that are unique to either type or size of Hard Drive. Please remember that your hard drive is a delicate instrument deserving of being handled with tender loving care.

- ☐ Read and follow the information provided in the *General Precautions* section on page 4 of this Instruction Manual.
- ☐ **Turn off and un-plug your computer and all devices (like printers etc.) that are attached to it before attempting to install the C Ltd. Hard Drive.**
- ☐ **Following the instructions provided with your Amiga A-2000, remove the cover from your computer and position the computer so that you are directly in front of it.**
- ☐ Determine the form-factor of the Hard Drive that you are installing. If you are installing a 5.25" drive, it will be located in the drive bay directly below the floppy drive that is now in place in your Amiga A-2000. If you are installing a 3.5" drive, it will be located in the drive bay to the immediate left of the floppy drive that is now in place in your Amiga A-2000. All future references to a *'drive bay'* will assume that you are working with the correct one!

☐ If you are installing an ***imbedded SCSI Hard Drive,*** thread the 50 conductor flat ribbon cable that is attached to your C Ltd. SCSI Host/Controller through the drive bay from the rear of the bay and out the front. (If the 50 conductor cable somehow became detached from the C Ltd. SCSI Host/Controller, you should plug it into the C Ltd. SCSI Host/Controller's 50 pin connector which is located about 1" from the rear of the circuit board. **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE SCSI HOST/CONTROLLER'S CONNECTOR. THE LOCATION OF PIN ONE IS PRINTED ON THE CIRCUIT BOARD OF THE SCSI HOST/CONTROLLER.**

☐ If you are installing an ***ST-506 Hard Drive,*** thread the 34 conductor and the 20 conductor flat ribbon cables that are attached to your SCSI to ST-506 device controller (which is the *'piggy-back'* circuit board attached to the C Ltd. SCSI Host/Controller) through the drive bay from the rear of the bay and out the front. (If either of the cables somehow became detached from the SCSI to ST-506 device controller, you should plug it into the appropriate connector, the 34 conductor cable only has one place where it can go, but the 20 conductor cable must be connected to the connector marked as 'J0'. Both of the connectors are located at the rear of the SCSI to ST-506 device controller's circuit board. **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE SCSI TO ST-506 DEVICE CONTROLLER'S CONNECTOR. THE LOCATION OF PIN ONE IS PRINTED ON THE CIRCUIT BOARD OF THE SCSI TO ST-506 DEVICE CONTROLLER.**

☐ If you are installing an ***imbedded SCSI Hard Drive,*** locate the 50 pin connector on the Hard Drive, and determine the location of PIN 1 of the connector. The location of PIN 1 can be determined by looking on the Hard Drive's printed circuit board for appropriate markings, or from the instruction manual supplied by the manufacturer of the Hard Drive. (Note: If the manufacturer supplied a manual to us, we will have included it with the system, some do, but some don't.) Connect the 50 conductor cable to the Hard Drive, but **BE ABSOLUTELY POSITIVE THAT THE CABLE IS CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE HARD DRIVE'S CONNECTOR.**

☐ If you are installing an ***ST-506 Hard Drive,*** locate the 34 conductor and the 20 conductor connection points at the rear of the Hard Drive. Connect the cables to the appropriate connectors, but **BE ABSOLUTELY POSITIVE THAT THE CABLES ARE CONNECTED SO THAT THE EDGE OF THE CABLE WITH THE RED WIRE IS CLOSEST TO PIN 1 OF THE HARD DRIVE'S CONNECTOR. THE LOCATION OF PIN ONE SHOULD BE CLEARLY PRINTED ON THE CIRCUIT BOARD OF THE HARD DRIVE.**

☐ Gently slide the Hard Drive mechanism into the appropriate drive bay. DO NOT use the mounting screws to mount the drive at this time.

☐ Locate the power supply wiring harness that is laying inside your computer between the drive bays and the power supply cage. The harness consists of four wires (Red, Black and White/White) with several four pin connectors on it. Connect one of the four pin connectors onto the matching four pin receptacle on the rear of the Hard Drive mechanism. These connectors are 'keyed' so they will only go on one way. If it don't fit don't force it!

☐ If you are installing an ***ST-506 Hard Drive,*** connect one of the remaining four pin connectors on the power supply wiring harness to the matching four pin receptacle on the SCSI to ST-506 device controller that is mounted on the C Ltd. SCSI Host/Controller.

☐ Using the four mounting screws (provided with the Hard Drive) mount the Hard Drive into the appropriate drive bay.

☐ Your Amiga A-2000 has a green Hard Drive Activity L.E.D. located below the red power L.E.D. indicator at the left front of the computer. To connect this indicator, locate the Hard Drive L.E.D. wiring harness that comes from the Hard Drive L.E.D. indicator. This wiring harness consists of a red and a black wire, terminated with a THREE conductor female connector. Locate the two pin connector at the extreme top edge, about in the middle of the C Ltd. SCSI Host/Controller. connect the THREE conductor female connector so that the two connections that are connected to the red and black wires contact the two pins on the C Ltd. SCSI Host/Controller, with the third (unused) contact pointed toward the rear of the computer.

☐ Take the cover from your Amiga A-2000 and remove the cover plate from the front panel so that the Hard Drive will be visible through the front panel.

☐ Now put the cover back on your computer, return to page 17 and complete the final steps in the configuration and testing of your system.

Generic (non-C Ltd.) Hard Drive Configuration and Formatting

Hard Drives supplied by vendors other than C Ltd. are in an unknown configuration! It is impossible to know that they have been properly formatted and it is very unlikely that they have the proper AmigaDOS format. For this reason it will be necessary for you to completely format your Hard Drive. The formatting process can take from as little as 5 minutes for some drives to a much as 16 hours for some high capacity drives. Be patient, don't rush, let the computer and C Ltd.'s formatting software fully complete their operations before moving on to the next step.

☐ From the power-on instructions in the previous step if the system is working properly, after about 10 to 15 seconds of floppy drive activity, the system will stop, and present you with an Amiga CLI window.

☐ Turn to the section of this manual titled *'Low-Level Formatting'*, format your hard drive as outlined in that section and return to this page when the formatting is completed.

☐ Turn to the section of this manual titled *'MLed, The MountList Editor'*, create a MountList and DevSetup file for your hard drive as outlined in that section and return to this page when it has been created.

☐ Turn to the section of this manual titled *'AmigaDOS Formatting'*, format your hard drive as outlined in that section and return to this page when the formatting is completed.

☐ Re-start your system and from the CLI window, TYPE:

DevInstall @Devs:DevSetup <RETURN>

Your floppy drive will activate and the DevInstall program will print its activities to your screen. If no errors are encountered, the program will exit and return to the standard CLI prompt. If, however, any errors are encountered the program will stop at the error. Return to the MLed program and fix the problem then re-run the DevInstall program as above.

☐ From the CLI window, TYPE:

Mount DH0: <RETURN> (**NOTE:** This assumes that the MountList entry is DH0:)

Your floppy drive will activate as the hard drive is mounted, but no activity will take place on the Hard Drive. If no errors are encountered, the program will exit and return to the standard CLI prompt. If, however, any errors are encountered the program will stop and report the error. Return to the MLed program and fix the problem then re-start your system, and re-run the DevInstall and Mount programs as above.

☐ From the CLI window, TYPE:

COPY DF0: DH0: ALL <RETURN>

Your floppy drive will activate and all files on the floppy drive will be transferred to your hard drive. Each file's name will be printed to your screen as it is copied.

☐ From the CLI window, TYPE:

COPY DF0:NewLook DH0:Disk.info <RETURN>

Your floppy drive will activate and the file on the floppy drive will be transferred to your hard drive. This file contains the Hard Drive's WorkBench Icon information.

☐ From the CLI window, TYPE:

COPY DF0:S/Start1 DH0:S/Startup-Sequence <RETURN>

Your floppy drive will activate and the file on the floppy drive will be transferred to your hard drive. This file completes the startup operation of your Hard Drive when ever you re-boot your computer.

NOTE: Customers Updating Existing C Ltd. Systems Should Follow The Instructions Provided In Addendum *Update-1*.

Updating Existing Systems

Because all of the necessary files are already on the disk, the easiest way to configure your Hard Drive under the SCSIdos 3.0 operating system is to use the SCSIdos 3.0 Boot Disk as your system boot-up 'WorkBench' Disk. If you do plan to use the Boot Disk, all you will need to do is change the items in the MountList (that is provided on the Boot Disk) that apply specifically to your Hard Drive. Use the MLed program as described below to edit the supplied mountlist.

1. Start with a back-up copy of your the Boot Disk in DF0: and Boot-up your Computer.

2. Put your old Hard Drive Boot-up disk in drive DF1:, Click into the active CLI window and type:

   TYPE >PRT: DF1:Devs/MountList <RETURN>

   This will cause your printer (assuming you have one) to print out a copy of the MountList that you *have been* using to access your Hard Drive.

3. Edit Mountlist as follows:
   a. Double-Click on the Boot Disk Icon.
   b. Double-Click on the MLed Icon.
   c. Click on the Value following 'Surfaces:'
   d. Delete the existing value
   e. Type in the Surfaces from your old MountList and press return.
   f. Click on the Value following 'BlocksPerTrack:'
   g. Delete the existing value
   h. Type in the BlocksPerTrack from your old MountList and press return.
   i. Click on the Value following 'LowCyl:'
   j. Delete the existing value
   k. Type in the LowCyl value from your old MountList and press return.
   l. Click on the Value following 'HighCyl:'
   m. Delete the existing value
   n. Type in the HighCyl from your old MountList and press return.
   o. Select Save Raw Data from the menu at the upper left of the MLed window
      OR
      simply hold down the RIGHT AMIGA KEY and press the 'S' key, to save.

4. Edit DF0:s/startup-sequence (using your Favorite Text Editor.)
   a. add the lines below as the second and third lines of the file:
      Mount (device name from the MountList)
      DefDisk (device name from the MountList)
   b. store the edited file as df0:s/startup-sequence

NOTE: Customers Updating Existing C Ltd. Systems Should Follow The Instructions Provided In Addendum *Update-1*.

Now, re-boot your system using the newly configured Boot Disk and after the system has come up and configured, do the following:

1. Copy DF0:Devs all to Devs:
2. MakeDir SYS:MLED
3. Copy DF0:MLed/#? to SYS:MLED

Setting up SCSIdos 3.0 on other WorkBench Disks

Setting-up SCSIdos 3.0 on disks other than the C Ltd. SCSIdos 3.0 Boot Disk is a bit more work than simply using the Boot Disk, but if you find it necessary it should be done as follows:

1. Start with a back-up copy of the target Boot Disk in DF0: and the SCSIdos 3.0 Boot Disk in DF1:
2. Copy DF0:Devs/CLtd.device to DF1:Devs
3. Copy DF0:Devs/SCSI.handler to DF1:Devs
4. Copy DF0:Devs/HardDisk.driver to DF1:Devs
5. Copy DF0:Devs/DevSetup to DF1:Devs
6. Copy DF0:Devs/DevInstall to DF1:c
7. Copy DF0:Devs/DevShow to DF1:c
8. MakeDir DF1:MLed
9. Copy DF0:MLed/#? to df1:MLed
10. TYPE >PRT: DF1:Devs/MountList
11. Edit Mountlist as follows:
    a. Double-Click on the Boot Disk Icon.
    b. Double-Click on the MLed Icon.
    c. Click on the Value following 'Surfaces:'
    d. Delete the existing value
    e. Type in the Surfaces from your old MountList and press return.
    f. Click on the Value following 'BlocksPerTrack:'
    g. Delete the existing value
    h. Type in the BlocksPerTrack from your old MountList and press return.

NOTE: Customers Updating Existing C Ltd. Systems Should Follow The Instructions Provided In Addendum *Update-1*.

i. Click on the Value following 'LowCyl:'
j. Delete the existing value
k. Type in the LowCyl value from your old MountList and press return.
l. Click on the Value following 'HighCyl:'
m. Delete the existing value
n. Type in the HighCyl from your old MountList and press return.
o. Select 'Write MountList' from the MountList Menu.
p. Select Save Raw Data from the menu at the upper left of the MLed window
OR
simply hold down the RIGHT AMIGA KEY and press the 'S' key, to save.

12. Copy DF0:Devs/MountList to DF1:Devs

13. Edit DF1:s/startup-sequence (using your Favorite Text Editor.)
a. add the line below as the first line of the file:
DevInstall @Devs:DevSetup QUIET (QUIET is optional)
b. store the edited file as df1:s/startup-sequence

Now, re-boot your system using the newly configured Boot-up Disk and after the system has come up and configured, do the following:

1. Copy DF0:Devs all to Devs:

2. MakeDir SYS:MLED

3. Copy DF0:MLed/#? to SYS:MLED

IMPORTANT OPERATIONAL NOTES:

DO NOT attempt to concurrently run SCSIdos 3.0 and any other revision of SCSIdos on the same partition, on the same drive or EVEN on the same computer!

DO NOT (unless specifically instructed to do so) attempt to use any of the old low-level formatting software or other hard drive utilities such as HDFormat, GenFormat, OmtiMat, SeaMat, ClearSCSI, SCSIcheck, Etc. which were supplied with C Ltd's old SCSIdos 2.xx release. Versions of thses programs which have been updated for use with SCSIdos 3.0 are available in the Utilities directory.

Using Your Hard Drive.

If you have followed the instructions provided, you now have floppy disk that will automatically *'boot-up'* and properly configure your Hard Drive every time you start up your system. A properly installed Hard Drive will function just like any other disk device. You can use your mouse to open windows, select icons and load programs just like you did with your floppy disks. From CLI, you can access the Hard Drive by using either its device name or by its volume name. The device name is whatever name you might have given it in the MountList entry for the Hard Drive, C Ltd. Hard Drives are setup using the device name DH0:. The volume name is the name used during the AmigaDOS format process and you can rename it just as you would rename any other disk. Using the device or volume name from CLI, you can run programs that operate in the CLI environment and do any AmigaDOS CLI commands just as if the system were running as a floppy disk based system.

You now have all of the information that is necessary to power-up and use the C Ltd. Hard Drive, but there are a lot more things that you can learn about your system that may make it an even more valuable tool. We would strongly suggest that you read all of the sections in this Instruction Manual, but especially the sections titled "Backing up your Hard Disk", "Partitioning your Hard Disk", "Potential Problems", "Trouble?" and "Calling Customer Service."

Enjoy your new found speed and performance, and be sure to read the C Ltd. Product Guaranty at the end of this manual, send in your Product Registration card so you are kept informed of the latest products we develop that may enhance the use of your SCSI Host/Controller and Hard Drive, and so that you will automatically receive any software update information that we make available.

NOTICE: All C Ltd. Hard Drives are shipped from the factory fully formatted with a lot of software on the drive. Many of the programs on the Hard Drive are demonstration versions of commercial programs that you can buy at your local Amiga dealer. These programs have been supplied by their manufacturers for your enjoyment with the hope that you, after seeing the demonstration of their program, will feel that their program is just what you've been looking for. It is possible that while shipping the Hard Drive you receive, one, several or all of the programs may become damaged or lost. Since these programs are provided to you at no cost, as a bonus, so to speak, and none of the programs has any commercial value, C Ltd. does not guarantee and will not replace any of the programs on the Hard Disk Drive. Your dealer, however, should have a fully loaded Hard Drive and may at his/her option allow you to copy the contents of his drive to yours.

Installing Software on a Hard Drive.

Surely one of the reasons that you bought a hard drive system was so that you could transfer many (if not most) of your software programs onto the drive. Most, *but not all,* programs can be transferred to the hard drive and will run properly when properly installed on the hard drive. As a general rule, about the only programs that don't do well on a Hard Drive are heavily protected games. We have never encountered a non-game program that couldn't be successfully installed on a Hard Drive.

Many companies provide a simple, automatic Hard Drive installation program that will install their program(s) on the Hard Drive. All programs should have a section in their instruction manual detailing the proper procedure to be followed to install the program on a Hard Drive. But, as we well know, this is not a perfect world and not all things that should be done are done, and there are programs that don't have instructions for hard drive installation. In such cases, we recommend that you contact the manufacturer (or distributor) of the product and make them aware of their oversight and request specific instructions (orally, and followed up in written form) for the proper installation of their product. If this fails, contact your dealer or local user group for instructions or assistance. **DO NOT** call C Ltd.'s Customer Service for help in installing OTHER COMPANY'S software onto our Hard Drives except as a last resort, the odds are 50 to 1 that we have no idea how to do what you want to do as we probably have never seen or used the program that you are trying to install.

IMPORTANT RULE:

NEVER, NEVER simply copy the entire contents of a floppy disk onto your hard drive. Do not, for example use

```
1> COPY DF0: DH0: ALL  <RETURN>
```

as the result of this command will be the replacement of some files on your Hard Drive with similar files from the floppy disk being copied which is guaranteed to cause problems with the operation of your Hard Drive!

The AmigaDOS Mount Command

The Amiga computer (operating under DOS 1.3 which is provided with the C Ltd. SCSI Host/Controller and Hard Drive) provides two commands that allow it to recognizing external devices. These two commands are Mount and BindDrivers. Only the **Mount** command is provided in the 'C' directory of your AmigaDOS 1.3/SCSIdos 3.0 Boot Disk. We have to date found the **BindDrivers** command to be undesirable in some applications. As of this writing, we will limit SCSIdos 3.0 to using only the Mount command by supplying only the required software to work with the Mount command. We are confidant that our driver software for the Mount command is reliable, and because both systems (Mount and BindDrivers) accomplish the same task, we will not support the BindDrivers command until such time as we are confidant that both the AmigaDOS support and our support of that command will produce reliable results.

IMPORTANT NOTE: Some devices require the use of the BindDrivers command, in such cases, you should use the **Mount** command to mount all C Ltd. devices **BEFORE** issuing the BindDrivers command.

Using The Mount Command.

The Mount command may be typed-in directly from CLI or it may be placed in the S/Startup-Sequence script file on the C Ltd. Boot (or any other WorkBench 1.2) Disk. (Those unfamiliar with using script files such as the s/startup-sequence file should consult their Amiga Instruction Manual and/or the AmigaDOS Manual for additional information.) When it is called, the Mount command looks in the DEVS directory on the Boot Disk (or in the currently assigned DEVS: directory, if a reassignment has been made or if the system is being booted from another device, for a file called MountList. There is only one MountList in the DEVS: directory and it must contain all of the device names and the information about all of the devices to be mounted. (See the section titled *'MountList Files'* and the sample mountlist on page 45.)

The format for the Mount command is:

1> MOUNT [device] <Press Return>

[device] refers to the name of one of the devices contained in the MountList file.

Examples:

1> MOUNT DH0: (Mounts the device DH0: as specified in the MountList.)
1> MOUNT DH1: (Mounts the device DH1: as specified in the MountList.)

REMEMBER: You must have a separate Mount command for each device that you wish to mount and the device name supplied as part of the Mount command must correspond to a device listed in the MountList file.

The SCSIdos DevInstall Command

If you are planning to set up your own custom WorkBench Disk and you want to boot your Hard Drive from it, or if you want to be able to re-boot your computer from the Commodore Recoverable Ram Device, you should become familiar with the operation and requirements of the C Ltd. DevInstall program. Whenever the computer is booted or re-booted, DevInstall **must** be run before attempting to Mount or access any SCSI device connected to a C Ltd. SCSI Host/Controller. The DevInstall program should be placed into your boot disk's C: directory and executed automatically from your Startup-Sequence, but there are cases where you might want to manually run the program.

The DevInstall program looks in the currently assigned DEVS: directory for the file called DevSetup. DevSetup contains information used to configure your Hard Drive including all user selected options. It is a standard ASCII file that can be edited with any text editor or word processor able to store files in straight ASCII format. The DevSetup can also be easily edited using the MLed program supplied with SCSIdos 3.0. (See the section in this manual titled *'MLed'* for information about using MLed, and the section titled *'Sample DevSetup File'* in the Tech. Ref. Manual for information about the DevSetup file.) If the file is found, DevInstall reads the information contained in the file and configures the SCSIdos 3.0 software as specified.

The format for the DevInstall program is:

1> DevInstall @Devs:DevSetup [QUIET] <RETURN>

In the above format, @Devs:DevSetup is the complete path and file name of the file containing the configuration information required. Also, [QUIET] is an option that if omitted causes the DevInstall program to echo (print) to the screen each item in the DevSetup file as it is read. Using the [QUIET] option speeds-up system initialization substantially by doing away with any screen messages. Omitting the [QUIET] option however can be a valuable tool when errors exist in the DevSetup file, as the display stops at the errors as they are encountered.

NOTES FOR ADVANCED USERS:

Although the DevInstall program is quite quick, if you have a lot of partitions and/or devices to be mounted, reading a lengthy DevSetup file from the floppy disk can be quite time consuming. The way to short cut this is to create a DevSetup file on your Boot floppy that contains only the information necessary to mount the first partition, then assign all the logical devices to your Hard Drive, and transfer control to (execute) another executable start-up file on your Hard Drive. Now, from this executable file, run the DevInstall program again. This time the program will read data from the DEVS: directory on your Hard Drive where you have stored a second DevSetup file that contains the configuration data for all other partitions and/or devices that you want to mount. (**NOTE:** Be sure that the second DevSetup file doesn't repeat the data that was contained on the boot floppy and was used to configure the initial partition. I'm not quite sure what will happen in this situation, but I'm reasonably sure that the results would be rather questionable and probably somewhat undesirable.)

There is another situation when it might be desirable to re-run the DevInstall program. Many users (myself included) have partitions on their systems that are not accessed very frequently. (ie. used for back-up, mass storage of pictures, extra fonts, etc.) In these cases, you may not access a partition like this every time you use your system, or even every tenth time you boot-up. To save time (during boot-up) and memory (every mounted partition requires some memory) you may wish to construct one or more small script files and matching DevSetup files that will allow you to easily add these seldom used partitions or devices whenever they are to be used. For example two partitions called *'Back1:'* and *'Back2:'* exist and are used occasionally for back-up of some data files. You could easily create two versions of the DevSetup file called *'DevSetup.Back1* and *'DevSetup.Back2* that contain ONLY information about each of these partitions respectively. then you could create two script files called *'M1'* and *'M2'* that would look like this:

```
; Script file to Mount Back1: device

    DevInstall @DEVS:DevSetup.Back1:  QUIET
    Mount Back1:
    ECHO "Back1: Now Mounted!"

; End of File
```

Now, whenever you want to use Back1: you could simply type:

```
>1 Execute M1   <RETURN>
```

NOTE: If you put the script files (M1 and M2) in the currently active 'S:' directory, you don't need to supply a path with the file name because, when using the execute command, the S: directory is always searched for the existence of the requested file.

The Startup-Sequence

One of the reasons that you bought a Hard Drive was probably speed of operation, and if that wasn't one of the reasons, you'll soon become totally spoiled by the response time of your Hard Drive and cringe at the thought of returning to a floppy drive based system. It even causes some people to shudder when they have to load data from or save data to a floppy once in a while. So, is is reasonable to assume that you want to take advantage of the speed of your Hard Drive whenever possible.

One of the best, but most often over-looked areas where a noticeable improvement can be made is during the boot-up sequence. When you start an Amiga, the computer starts its execution of the Startup-Sequence in the S: directory of the floppy disk in DF0:. It is just common sense to transfer control of the system to the Hard Drive *as soon as possible*. Therefore the best Startup-Sequence would be the shortest possible one. After a lot of experimentation, the following Startup-Sequence has emerged as the winner.

```
;  The Shortest Startup-Sequence

     C:DevInstall @DEVS:DevSetup -QUIET
     C:Mount DH0:
     DH0:c/DefDisk DH0:
     C:CD RAM:
     C:Execute S:HD-Start

;  End of File
```

In the above file:

'DefDisk' is a PD program that automatically assigns ALL logical devices (ie C:, S:, DEVS:, etc.) to the device specified.

The ***'CD RAM:'*** is included for several reasons. Because AmigaDOS automatically writes a temporary file to the current directory whenever one script file (the Startup-Sequence in this case) attempts to execute another script file (HD-Start in this case), assigning the current directory to RAM: is a lot faster than leaving it assigned to the floppy and if your floppy is write protected (you do write protect your boot disk for Virus protection don't you?) then an error would occur. Also, if you assigned the current directory to the Hard Drive, and then did a LoadWorkBench from the HD-Start program, the AmigaDOS would see the temporary file as an open file on the Hard Drive and attempt to ***validate*** your Hard Drive which you definitely don't want to do.

The *'Execute S:HD-Start'* line causes the execute command to look in the currently assigned 'S:' directory (now assigned to DH0: by the DefDisk command) for an executable file called HD-Start. You could of course use any name you desire in place of HD-Start. Once the HD-Start file is found, execution is transferred to it and the sequence is continued following any additional instructions in the HD-Start file.

Now if you want or need to add commands to create a long involved startup procedure, put all the commands into the HD-Start file in the S: directory of your Hard Drive, where they will be executed totally from the Hard Drive at twenty times the speed they would have executed from the floppy. The Startup-Sequence provided on the C Ltd. SCSIdos 3.0 Boot Disk is a good example of using the techniques described here, so take a look at it and use it as an example to follow.

MLed™ - The MountList Editor

Special Note: The MLed program was written by and is provided with the permission of Steve (AKA SteveX) Tibbett, to whom we will be eternally grateful. Steve is also the author of several excellent public domain programs, including VirusX, the Virus Killer, and DiskX, a very good disk editor which works equally well with both floppy and hard drives. The latest versions of each of these P.D. programs and many others are available on our free BBS. We at C Ltd. would like to thank Steve, not only for his contributions to our projects, but also for his many P.D. contributions that have benefited all Amiga users. Amigaphiles, like Steve, who contribute their time and efforts to improve our environment too often go un-noticed and un-rewarded, but they have provided all of us with otherwise unavailable tools without which the development of the Amiga would not be any where near its present level.

Starting up MLed from WorkBench or CLI

MLed (or the MountList Editor) is a very easy to use fully Amiga interfaced editor designed specifically to edit the MountList and DevSetup files that are necessary to the operation of SCSIdos 3.0. To start-up MLed from the Amiga WorkBench, simply Double-Click on the MLed Drawer and then Double-Click on the MLed Icon. To start up MLed from an active CLI just Change Directory to the MLed directory by typing:

CD SYS:MLed <RETURN>

and then run the MLed program by typing:

RUN MLed <RETURN>

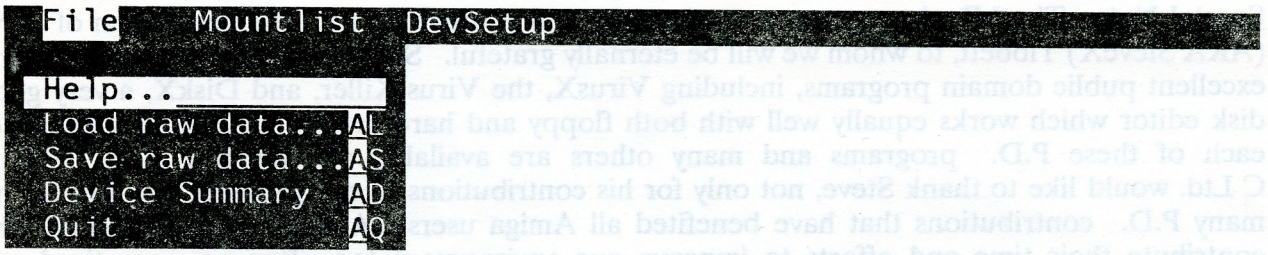
After it is run, the MLed program will automatically read the information contained in the MountList and DevSetup files from the currently assigned DEVS: directory, open a custom screen, and display the Mountlist Editor Screen (which is one of the three available editor screens) with the data read from your MountList.

Using MLed

The Menus

Pressing the right mouse button will (as displayed above) reveal three menus names on the menu bar at the top of the MLed screen. The available menus are Files, MountList and DevSetup. Each of these menus offers several possible selections and the following will describe each of the selections and its function.

The Help Mode

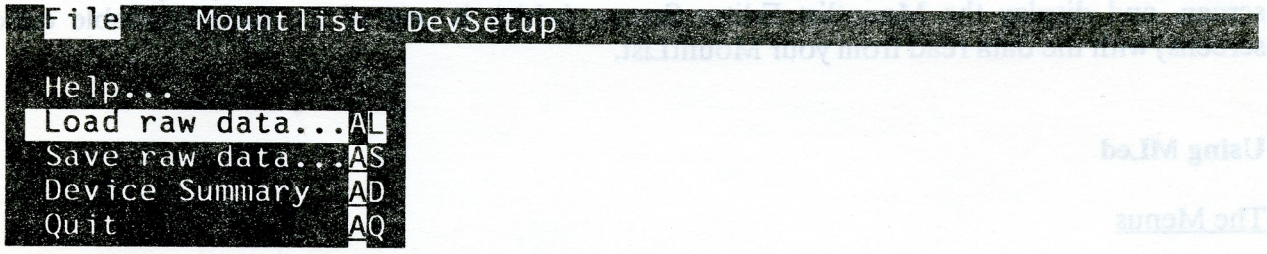


The MLed program has two modes of operation, the *'Data Entry Mode'* and the *'Help Mode'*. Selecting `Help` from the `File` menu as shown above causes the MLed program to switch (or toggle) between these two modes. In the Help Mode, the lower section of the screen is replaced by instructions for the use of the Help Mode. From the Help Mode, you can get a short explanation of **ANY** item on the screen.

If you want to know about an item that is one of the ON/OFF type selections, use the mouse to 'select' the item. The information about that item will be displayed with a line at the bottom telling you to press <RETURN>. After you have read the information, press <RETURN> to get back to the normal display.

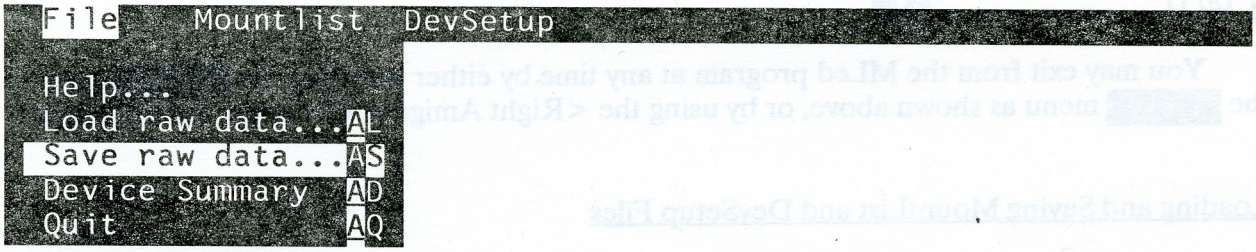
If you want to know about an item that is one of the Data Entry type selections, use the mouse to 'select' the item, then press <RETURN>. The information about that item will be displayed with a line at the bottom telling you to press <RETURN>. After you have read the information, press <RETURN> to get back to the normal display.

Loading And Saving Raw Data



To make the installation of new systems easier, we will provide configuration files for various types of Hard Drives and other SCSI Devices in a *'raw data'* format which can easily be loaded into the MLed program by selecting the `Load raw data` item from the `File` menu as shown above, or by using the keyboard equivalent <Right Amiga + L> .

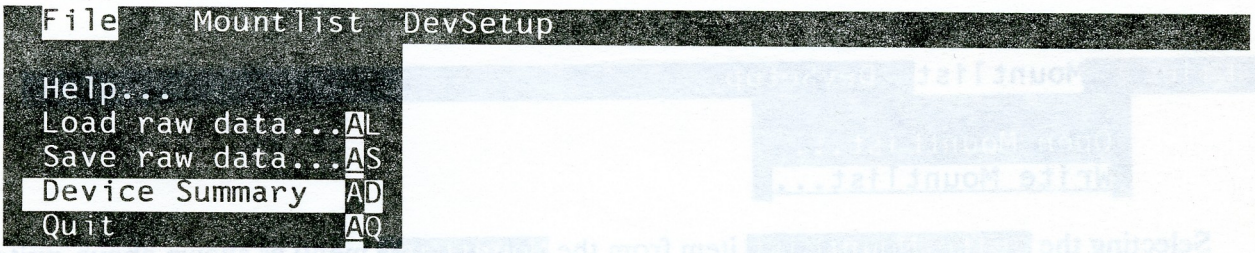
Selecting the `Load raw data` menu item will cause the MLed program to display a *'File Requester'* that will display the available configuration files. (NOTE: The configuration files supplied by C Ltd. are in the SYS:MLed/Presets directory, but you can load data from other directories by entering the desired directory path in the file requester's drawer area.)



When you have finished the creation/modification of your MountList and DevSetup files, we recommend that you use the `Save raw data` item from the `File` menu to store copies the information on both your Boot disk and on your Hard Drive as permenant back-ups of your MountList and DevSet-up files. Use either the `Save raw data` item from the `File` menu as shown above, or the keyboard equivalents <Right Amiga + S> to store the raw data.

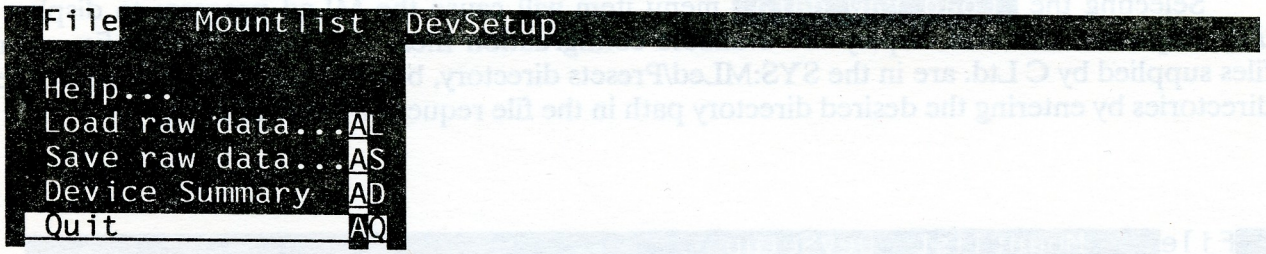
Selecting the `Save raw data` item or pressing <Right Amiga + S> will cause the MLed program to display a *'File Requester'* that will display the currently stored configruation files. (NOTE: The configuration files supplied by C Ltd. are in the SYS:MLed/Presets directory, but you can save data in other directories by entering the desired directory path (ie. DH0:DataFiles, etc.) in the file requester's drawer area.)

The Device Summary



The Device Summary will display 'on srceen' the storage type (ie. Hard Drives, etc.) devices that are available for mounting within the currently configured MountList. The Summary will display the Device's Name, Unit Number, High and Low Cylinders as well as the Storage Capacity of the Device. You can select the `Device Summary` display from the grp10 REV]|File| menu as shown above, or by using the keyboard equivalent <Right Amiga + D>. From the Divece Summary display, you must press <RETURN> to go back to the previous screen.

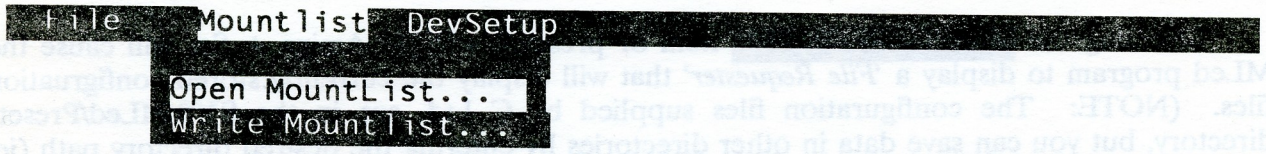
Quitting MLed



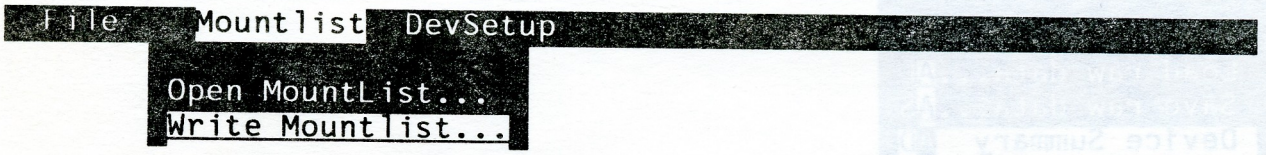
You may exit from the MLed program at any time by either selecting the `Quit` item from the `File` menu as shown above, or by using the <Right Amiga + Q> keyboard equivalent.

Loading and Saving MountList and DevSetup Files

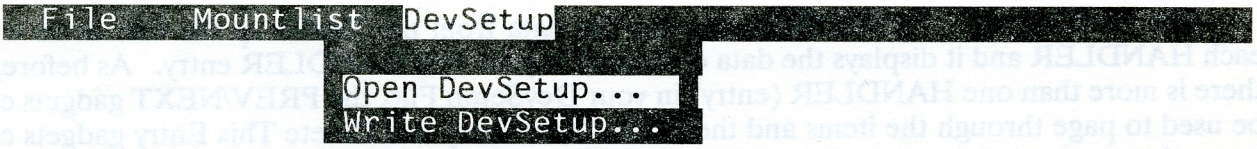
The Load and Save raw data options discussed earlier are handy ways to store a lot of various configurations in a compressed format, but the system needs the MountList and DevSetup files in a standardized text format, so the MLed program provides menu selections that read and write MountList and DevSetup files in the proper format as well.



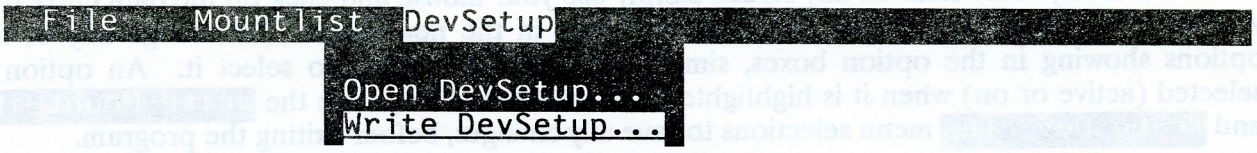
Selecting the `Open MountList` item from the `MountList` menu as shown above, loads the current MountList information from the currently active DEVS: directory into the MLed program. This a handy way to get back to 'ground zero' if you have been editing the mountlist entries and lose track of where you are, or make too many mistakes to easily correct.



Selecting the `Write MountList` item from the `MountList` menu as shown above, writes the current information from the MLed editor to the MountList file in the **currently active DEVS: directory.** This option **replaces** the existing MountList file with a new file containing the data you entered (or edited) using MLed. If you make any changes to any of the items on the mountlist page they will need to be made to the currently active MountList file as well, you **absolutely must** use the `Write MountList` to save the changes you have made if you wish to use these changes.



Selecting the Open DevSetup item from the DevSetup menu as shown above, loads the current DevSetup information from the currently active DEVS: directory into the MLed program. This a handy way to get back to 'ground zero' if you have been editing the units and handlers entries and lose track of where you are, or make too many mistakes to easily correct.



Selecting the Write DevSetup item from the DevSetup menu as shown above, writes the current information from the MLed editor to the DevSetup file in the **currently active DEVS: directory.** This option **replaces** the existing DevSetup file with a new file containing the data you entered (or edited) using MLed. If you make any changes to any of the items on the units page or the handlers page, they will need to be made to the currently active DevSetup file as well, you **absolutely must** use the Write DevSetup to save the changes you have made if you wish to use these changes.

What you can edit.

There are three screens of information that can be displayed and edited with MLed, these three editing screens will allow you to edit everything in your MountList and DevSetup files. You can go to any of the three pages by selecting it with the *See Mountlist, See Units* and *See Handlers* gadgets at the bottom of the screen.

On start-up the initial screen MLed displays is the MountList Screen and the data contained in the first entry of your MountList. If there is more than one DEVICE (entry) in your MountList, the PREV/NEXT gadgets can be used to page through the items and the Create New Entry and Delete This Entry gadgets can be used to create additional Mountlist entries, or delete obsolete entries.

The second screen (UNITS) contains the data from the DevSetup file that deals with each UNIT and it displays the data contained in your first UNIT entry. As before, if there is more than one UNIT (entry) in your DevSetup File, the PREV/NEXT gadgets can be used to page through the items and the Create New Entry and Delete This Entry gadgets can be used to create and delete additional UNIT entries.

The third screen (HANDLERS) contains the data from the DevSetup file that deals with each HANDLER and it displays the data contained in your first HANDLER entry. As before, if there is more than one HANDLER (entry) in your DevSetup File, the PREV/NEXT gadgets can be used to page through the items and the Create New Entry and Delete This Entry gadgets can be used to create and delete additional HANDLER entries.

Editing Data.

To edit any value item on any screen simply use your mouse and click on the data entry that you want to change, delete the old value and type in the new value. To change any of the options showing in the option boxes, simply click on that option to select it. An option is selected (active or on) when it is highlighted. **Remember:** Always use the `Write MountList` and `Write DevSetup` menu selections to save any changes, befoer exiting the program.

Getting Help.

As described in the 'Help' section above, there is help available **EVERY** possible item. The help supplied includes not only a brief description of the item selected, but in most cases, you will be told where to get the information (Source:) and provided with examples, suggestions, or specific values to be used with the item.

Formatting A Hard Drive

Like Floppy Disks, all Hard Disk Drives must be formatted prior to use. Unlike Floppy Disks, however, Hard Disk Drives have two stages of formatting. The first stage (called the Low-Level Format) is done by the FormatHD program which is supplied by C Ltd. This format process actually constructs the areas, called sectors (or data blocks) on the Hard Drive into which data will be stored and then tests each sector and replaces any sectors that are found to be defective . (It is very normal to find several bad sectors on a Hard Drive, this does not mean that the Hard Drive is defective.) The actual method of replacement varies with different Hard Drives from simply skipping over bad sectors to actually replacing them with good sectors from a reserved area of spare sectors, all methods, however, maintain a record (written on the Hard Drive) of the bad sector locations and the method of replacement. The second stage of the format process (called the DOS format or AmigaDOS format) is done with the standard AmigaDOS format command, which puts the information on the Hard Drive that will be needed by the Amiga's operating system so that it can recognize the Hard Drive and store data on it.

Though the SCSI format command is a standardized SCSI command, each manufacturer of SCSI Hard Disk Drives and/or SCSI SCSI to ST-506 Hard Drive Controllers is allowed to use a unique formatting sequence that is optimized for their drive. Because Hard Disk Drives can be used with many different computers, the Low-Level format is generic, once a Hard Drive has been Low-Level formatted, it can be DOS formatted by any computer (Amiga, Atari, IBM, etc.) and used with that type of computer. The Low-Level format therefore is specific to the manufacturer of Hard Drive being used and independent of the type of computer it is being used on.

Every type of computer, however, has its own specific specific format for storing information on the disk so that the disk can be recognized by the computer. The AmigaDOS format program is used to generate that information which is specific to the Amiga, but is independent of the type of Hard Drive used, likewise IBM, Apple and others have their own DOS level format programs and none are compatible each other.

The next two sections of this manual will cover, respectively, The C Ltd. FormatHD program (with its FEdX user interface by Steve Tibbett) and Commodore's AmigaDos Format program. **Remember,** these two programs are totally different and serve totally different functions, be sure that you are using the correct program for the task that you are undertaking.

When To Use the Low-Level Format Program

WARNING: **Using the Low-Level Format programs will erase all of the information on your drive, totally, completely and forever.**

NOTICE: **The C Ltd. Low-Level formatter *WILL NOT* format a device unless it has been installed. Proper installation requires that the device has a valid Unit entry in the Devs:DevSetup file, and that the Unit has been installed by running the DevInstall program.**

NOTICE: **As a safety precaution, the C Ltd. Low-Level formatter supplied here *WILL NOT* format any device that has been mounted.**

When Should a Hard Drive Be Low-Level Formatted?

All C Ltd. Hard Drives are shipped from our factory fully formatted, and unless something has happened to your drive (during shipping, or during use of the drive) that requires that the drive be fully re-formatted, you should not need to use the Low-Level Format.

The Low-Level Format program should be used **only** in the following cases:

1. When you are setting up a Hard Drive that has never been formatted.
2. When you want to change the Hard Drive's Interleave.
3. When, after a drive crash or other error, you are not able to re-establish the disk by re-formatting with the AmigaDOS Format program.
4. When repeated read/write errors indicate the the Hard Drive has developed a defective sector that must be *'mapped-out'*, C Ltd.'s **ReadERR** program can be used to confirm possible defective sectors.
5. When, for security reasons, you wish permanently to erase all data from the Hard Drive.

Low-Level formatting is not required when restructuring a drive for the purpose of partitioning the drive into several partitions (or returning it to a single partition) or for simple re-formatting of the drive that may be required after most crashes. In these situations refer to the sections in this Manual titled *Partitioning Your Hard Drive, AmigaDOS Formatting a Hard Drive,* and *Potential Problems and/or Unexpected Events.* If, however, you are going to format your hard drive at the DOS level, and you have the extra time needed to do a Low-Level format, you may wish to do so, just to make sure that any recently developed defective sectors are properly replaced.

The Low-Level Format program does several very important things. It formats the drive at the lowest possible level, it verifies that the format you are requesting is within the capabilities (this is not an absolute test but a simple comparison of parameters) of the drive you are using, it sets up the number of cylinders to be used and it creates the proper number of sectors (or blocks) on each track. The Low-Level Format program also sets the Interleave while it is formatting, for more information on interleaving, see the section in this Manual titled *'Setting The Interleave'*. While it is doing all this, the Low-Level Format program writes, reads and verifies data to every location on the Hard Drive, and if bad sectors are found, they are automatically *'mapped out'* and made unavailable for use.

The mapping out of bad sectors during the Low-Level format programs operation is the reason that you may at some point have to re-format your drive. If in use, the drive develops a bad sector, you will have to re-format the drive with the Low-Level format program to map out that bad sector so that it will not be used and will not cause any problems in the future. Though it is not possible to make a drive that will never develop any bad sectors, it is possible to predict with a reasonable amount of accuracy which sectors are likely to fail in the near future. So in an attempt to limit future failures our Low-Level format program does a worst case test that actually finds the sectors that will probably fail in the future and blocks them out of the system right along with the known bad sectors.

REMEMBER: Though we are trying our best to eliminate any possible problems you might encounter, there is no way to prevent eventual drive failures, no system is perfect so:

ALWAYS BACK-UP IMPORTANT DATA !!!!!!!!!!!!

See the section on *'Backing Up Your Hard Drive'* in this manual.

As stated earlier, different SCSI Hard Drive manufacturers may require different formatting routines. We have included several different Low-Level formatting routines within the C Ltd. Low-Level formatter (the next section of this manual covers the FEdX Low-Level formatting program) which through their various set-up parameters will accommodate over 95% of the hard disk drives which are currently available. If you have a Hard Drive that is not listed in our list of default hard drives (the list is displayed within the FEdX program), or won't Low-Level format, or returns errors when attempting to use the Low-Level format program, please contact our Customer Service department for assistance.

The FEdX Low-Level Format Program

Low-Level Formatting and The FEdX Program

'FEdX', contrary to popular belief is not a fast way to send someone a package! Within the confines of C Ltd.'s SCSIdos_3.0, *FEdX* means *'Format File Editor'* and the 'X' means that the program was originated by the same Steve (AKA SteveX) Tibbet who wrote the MLed program which was covered in an earlier section of this manual. *FEdX* itself is really what is referred to as a 'front-end' program, it provides a *'user-friendly'* interface, but it really doesn't do any of the actual work. The *FEdX* provides you with a nice icon oriented interface, complete with HELP screens, which guides you through the necessary steps to low-level format your Hard Drive, but when that part is done, *FEdX* simply (and automatically) runs another program that actually does the formatting of the drive. These separate programs work together to form one complete program. The actual program that does the Low-Level formatting of your Hard Drive needs to know what kind of drive is to be formatted (as we said, they're all different) and other important things like cylinder and head count. Now the programmer who wrote the Low-Level formatting programs knows enough about Hard Drives and such that he can simply sit there and type in the required data, but he's probably the only one in the world who could. So to make things a bit easier, the program looks for a configuration file (the user supplies the path and name of the file) that has been written to contain the proper information. That makes things somewhat easier, but the file still has to be created and/or edited and that means that the user would still need to learn a lot about Hard Drives if he/she ever wanted to get the drive Low-Level formatted.

This is where 'FEdX' comes in to save the day. Simply put, FEdX does all of the dirty work. 'FEdX' reads in existing configuration files, allows you to edit them through a nice clean Amigatized Intuition style interface, then stores the files back on the disk in the proper format and finally wakes up the real Low-Level Format program and tells it what to do. So from your point of view, FormatHD doesn't even exist, as it would seem that 'FEdX' is really the Low-Level formatting program. It really isn't, but 'FEdX' is your connection to the Low-Level formatter.

Due to the possible complexity Low-Level formatting process and the absolute requirement that the Low-Level formatting be done correctly if reliable Hard Drive performance is to be achieved, this manual will provide step by step instructions for the formatting process, as well as providing the normal descriptions of the FEdX program and its functions. If you are planning to format Low-Level format your Hard Drive, it is recommended that you first read this entire chapter covering the Low-Level formatter, then follow the step by step instructions provided herein.

Step by Step Low-Level Formatting of a Hard Drive

NOTICE: If at any time during the formatting of your drive you encounter a problem or condition that is not covered in this section, call our Customer Support line immediately for assistance. DO NOT waste your valuable time trying to figure out what went wrong.

Before beginning the process of *'Low-Level Formatting'* your Hard Drive, you **MUST** make a back-up copy of the floppy disk that you are currently using to boot-up your Hard Drive **AND** you must **RENAME** the disk with the name ***SCSIdos_3.0*** . The Low-Level Format program needs information contained on your system boot disk and the method that we chose to get this information **REQUIRES** that the a disk named ***SCSIdos_3.0*** will contain that information. You should, *of course,* be using a working copy (a back-up) of the C Ltd. SCSIdos_3.0 Utilities Disk which is named *'Utilities'*.

1. Put your working copy of the SCSIdos_3.0 Utilities Disk into DF0: and re-boot your system by pressing Amiga/Amiga/CTRL.

2. Copy your current Mountlist and DevSetup files from the devs directory of your Boot disk to the devs directory of the SCSIdos_3.0 Utilities Disk as shown below:

   1> COPY SCSIdos_3.0:Devs/MountList to Utilities:devs <RETURN>

   1> COPY SCSIdos_3.0:Devs/DevSetup to Utilities:Devs <RETURN>

3. Run the DevInstall program as described on page 31 of this manual.

4. Now start the FEdX program from either WorkBench or from the CLI window.

   To start the FEdX program from Workbench, Double-Click (to open) the *'Utilities Disk Icon'*, then Double-Click (to start) the *'FEdX Program'* Icon.

   To start the FEdX program from the CLI window, type:

   1>FEdX <RETURN>

5 You should now be looking at the FEdX main screen as displayed on Page # 54, if not, return to Step # 1 and start again.

6 The *'Project'* menu (see Page # 50) is located at the top left of the FEdX screen. Using your mouse, pull down the *'Project'* menu and select *'LOAD'* from the menu.

7 There *may* now be a list of Hard Drives in the file requester window. The drives are listed by manufacturer's name and model number and the list is **NOT** sorted in alphabetical order, so search through the list carefully in order to locate your Hard Drive.

8 If you find your Hard Drive in the list, 'click' on the entry in the list which will put the name of your Hard Drive in the 'File:' box below the list of files. Check to be sure that the name of the Hard Drive in the 'File:' box matches your Hard Drive and then 'click' on the *'LOAD'* gadget at the bottom of the File Requester Window and go directly to step #15.

9 If you are not able to locate your Hard Drive from among those listed in the file requester, use your mouse and 'click' on (select) the file requester's *'CANCEL'* gadget which will close the file requester window and return you to the main FEdX screen.

10 If your Hard Drive is not one of the units for which we have supplied pre-configured files, you will have to create a file for your drive, which in turn means that you will need to know some information about your Hard Drive.

Before going on to the next step, you must determine if your Hard Drive is a SCSI Hard Drive (ie. does the Hard Drive have an internal SCSI controller), or is your Hard Drive an ST-506 Hard Drive which is adapted for use as a SCSI device by using an external SCSI to ST-506 device controller. If you are not able to determine this information yourself, call the dealer that sold you your Hard Drive, the manufacturer of the Hard Drive or our customer service department (in that order) for assistance.

If you have determined that your Hard Drive is not a SCSI drive that means that it must use a SCSI to ST-506 device controller, in which case you must determine the brand and model number of that controller. Generally, the controller will be a separate circuit board which may or may not be attached to the Hard Drive mechanism in some manner, and the controller will have identifying markings on it which will allow you to determine its manufacturer and its model number. The C Ltd. SCSIdos_3.0 formatting software currently supports ONLY the Adaptec ACB-4000, Adaptec 4010, Adaptec 4520 (in the ACB-4000 emulation mode), Adaptec ACB-4070, Adaptec 5200, Adaptec 5270, Omti 3520 and Omti 3527 controllers. If you have a SCSI to ST-506 device controller other than the ones listed above, call C Ltd.'s customer service service department for assistance.

11 Assuming that you have determined the proper information for your Hard Drive, *'pull down'* the *'Project'* menu and move your mouse down the menu until the *'DEFAULT'* item is highlighted. A sub-menu will now appear listing the possible default selections for the type of Hard Drive/Controller combination that you intend to format. Using the information gathered in step #10, select an item from the *'DEFAULT'* sub-menu as follows:

All SCSI Hard Drives --- Select IMBEDDED SCSI
Adaptec ACB-4000 --- Select Adaptec 4000 (MFM)
Adaptec ACB-4010 --- Select Adaptec 4000 (MFM)
Adaptec ACB-4520 --- Select Adaptec 4000 (MFM)
Adaptec ACB-5200 --- Select Adaptec 4000 (MFM)
Adaptec ACB-4070 --- Select Adaptec 4070 (RLL)
Adaptec ACB-5270 --- Select Adaptec 4070 (RLL)
Omti 3520 -- Select Omti 3520 (MFM)
Omti 3527 -- Select Omti 3527 (RLL)

12 After selecting the *'DEFAULT'* controller type from the *'PROJECT'* menu, a list of possible Hard Drives will be displayed in a window on the FEdX screen. The drives are listed by manufacturer's name and model number and the list is sorted in alphabetical order. Search through the list and locate your Hard Drive.

13 If you find your Hard Drive in the list, 'click' on the entry in the list which will put the name of your Hard Drive in the box below the list of files. Check to be sure that the name of the Hard Drive in the box matches your Hard Drive and then 'click' on the *'LOAD'* gadget at the bottom of the Window and go directly to step # 15.

14 If you are not able to locate your Hard Drive from among those listed in the file requester, use your mouse and 'click' on (select) the file requester's *'CANCEL'* gadget which will close the file requester window and return you to the main FEdX screen. You should now call C Ltd. customer support for further instructions.

15 If there was no list of defects or bad blocks provided with your Hard Drive, skip to step #18. If a list of defects and/or bad blocks was provided with your Hard Drive they should be entered now.

NOTE: All C Ltd. supplied Hard Drives come from our facility fully formatted with all defects *'mapped-out'*. Those drives the were *'Factory Formatted'* using SCSIdos_3.0 will have the defect list included in the Configuration File for the drive in the *'HardDrives'* drawer on the *'Utilities Disk'*. The defect list (if there were any defects found) will be stored and loaded automatically when you load/save the configuration file. If you have a Hard Drive that was factory formatted using SCSIdos_3.0 by C Ltd. (and therefore has a list of bad blocks included in the Configuration File) you may skip to step #18.

16 To enter the defect list provided by the manufacturer of the Hard Drive into the FEdX program, *'click on'* (select) the *'EDIT BAD BLOCK LIST'* icon. In some cases, a requester will appear on the screen asking for the format of the bad block list to be edited. If this happens, *'click on'* (select) the *'TYPE 1'* gadget.

17 When the Bad Block List Editor window appears on the FEdX screen, *'click in'* the **ADD>** box and type in the bad block list information provided with your Hard Drive. **NOTE:** the FEdX program expects the Bad Block List information to be entered in cylinder, head (surface) and byte order, with each item separated by one or more spaces followed by <RETURN> when all three items have been entered. Some manufacturers provide the information in a different order (ie. they may list the head or surface first, etc.) so be careful in entering this data.

If you make a mistake during the entry of the data, simply *'click on'* the incorrect entry and it will be put back into the **ADD>** box and you will be able to correct the entry.

When all defect information has been entered, *'click on'* the close window gadget at the top left of the Bad Block Editor Window.

18 You must now tell the FEdX program which Hard Drive to format. (This is especially important if you have more than one Hard Drive.) *'Click in'* the *'UNIT NUMBER'* box (located right under the C Ltd. logo on the FEdX screen) and enter the Unit Number from the DevSetup file (ie. Unit Number 1000, 1010, etc.) that applies to the Hard Drive that you wish to format. The UNIT NUMBER required here is the UNIT NUMBER as contained in the MOUNTLIST and is equal to the Unit Number of the DevSetup file *'Units'* entry that is referenced by the MountList. The UNIT NUMBER referenced here **IS NOT** the same as the SCSI address, SCSI priority or SCSI unit number of the device!

19 Now, *'click in'* the *'Verification Pattern Count'* box (located right under the Unit Number Box on the FEdX screen) and enter 7, unless you have a specific reason to use a different number.

20 Next, *'click in'* the *'Comment:'* box (located right under the Verification Pattern Count on the FEdX screen) and type in the Brand, model number and serial number of your Hard Drive. **NOTE:** In some cases some or all of this information may already be in the box, if so, be sure to check and verify that the information is correct.

21 Finally, before starting the actual Low-Level formatting of the Hard Drive, you should be aware that the FEdX program will REQUIRE you to save your Hard Drive's configuration back to the disk. So, before starting the format process and therefore, saving the file, recheck the entries in the FEdX program to be sure that all values are correct.

22 Now the time has come to format your Hard Drive. If you are confident that you have followed the directions up to this point, with your mouse, *'click on'* the *'Begin Format'* Icon (located in the upper-right of the FEdX screen). First, you will be REQUIRED to save the updated Configuration File, so you will be presented with the *'SAVE'* file requester. Use your mouse to *'click in'* the *'File:'* box and type in the name that you wish to use to save your Hard Drive's Configuration File. Finally, 'click on' the *'SAVE'* gadget to save the file. After the Configuration File has been stored, the actual *'Low-Level Formatting'* process will commence.

Activity and Results of the Low-Level Formatter

After selecting the *'Begin Format'* Icon, the FEdX screen will automatically close and a New CLI window will be opened to provide a communication path for the Low-Level Formatter Routines. The first thing you will notice will be that the Low-Level Formatter Routine will print the information from the Configuration File into the CLI window and ask you to verify that you do, in fact, want to format your Hard Drive. You MUST respond with the complete word *'yes'* in response to this prompt or the formatter will assume that you want to abort the formatting process and simply quit right there.

Once the formatter has started its operations, the status of the Hard Drive and the various operations that the formatter is performing will be continually printed into the CLI window. As the Write/Read/Verify tests are performed, the progress of the test will also be reported. If any defects are found, they will automatically be added to the Bad Block List which is now being maintained by the Low-Level Formatter Routine. When the format is complete, *'if and only if'* any defects are added to the Bad Block List, the Low-Level Formatter Routine will ask you if you want to save the Bad Block List with the newly added/found defects. Again, you MUST type in the complete word *'yes'* in response to this prompt to save the new list. After saving the new list, the program will exit.

If during the Low-Level Format the program encounters an error (other than a media defect) it will terminate with an error message explaining what went wrong. Again, if you are not able to get your Hard Drive formatted, please call C Ltd.'s customer service line for assistance.

If for whatever reason you want to terminate the format while it is in progress, you can use the standard Amiga convention <CTRL>/C to break out of the formatter. Be forewarned however that abandoning the format before it is complete will render the Hard Drive totally useless until a complete low-level format has been accomplished.

If you have successfully completed the Low-Level Format of your Hard Drive, you should now proceed to the section of this manual titled *'AmigaDOS Formatting Your Hard Drive.'*

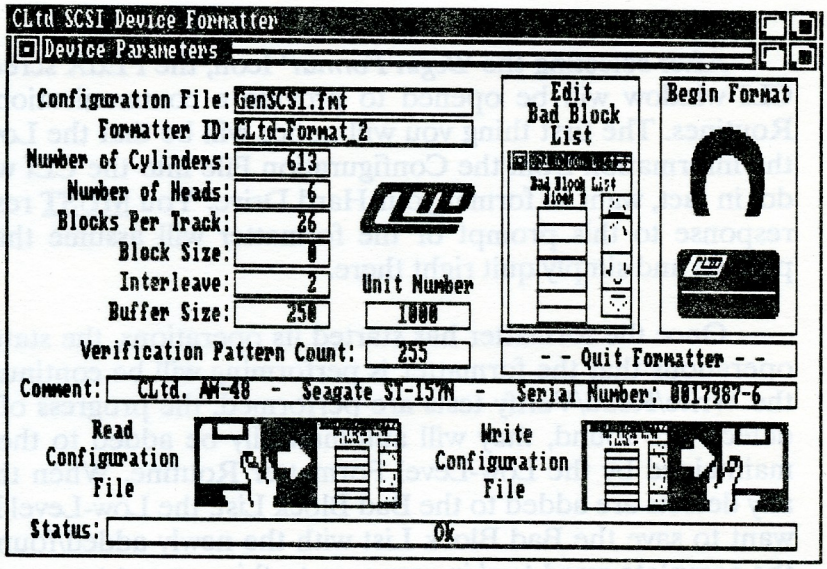
General Description of the FEdX Program

NOTICE: The C Ltd. Low-Level formatter *WILL NOT* format a device that has not been installed. Proper installation requires that the device has a valid Unit entry in the Devs:DevSetup file, and that the Unit has been installed by running the DevInstall program.

NOTICE: As a safety precaution, the C Ltd. Low-Level formatter supplied here *WILL NOT* format any device that has been mounted.

The Main FEdX Screen

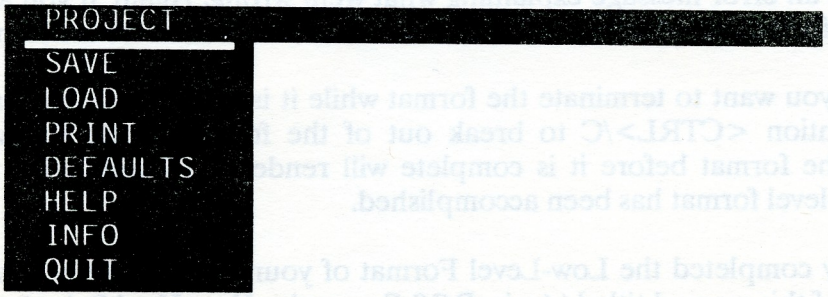
When the program has been loaded and is active, it should look similar to the screen shown at the right.



The FEdX Main Screen

Project Menu

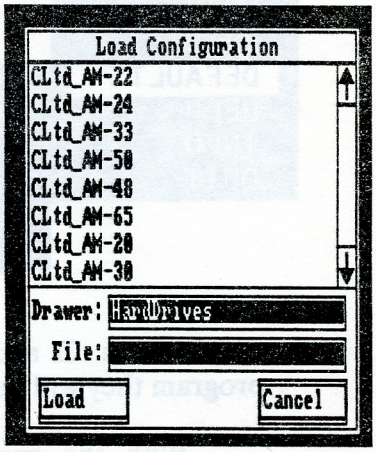
In the upper left hand corner of the FEdX screen is a pull-down menu called the project menu, which offers seven possible selection options. The available menu options are:



The usage and function of each of these possible menu selections is explained in detail in the following few pages.

SAVE

You should use the *'SAVE'* menu selection to store new or updated Configuration Files for future use. When you have completed editing a configuration file, selecting this menu item will bring up a standard Amiga type file requester (like the one shown at the right, except it will have a *'Save'* gadget instead of the *'Load'* shown here) which will allow you to enter the directory path and file name to be used to store the new or updated Configuration File.



Save/Load File Requester

LOAD

Selecting this menu item will pop up a standard Amiga type file requester window which will allow you to locate the Configuration File for your Hard Drive. To load a configuration file into the FEdX program click on the desired file and then click on the *'Load'* gadget at the lower left of the File Requester. As soon as the file is loaded, the FEdX program will display the values from the file in the various data locations around the FEdX screen.

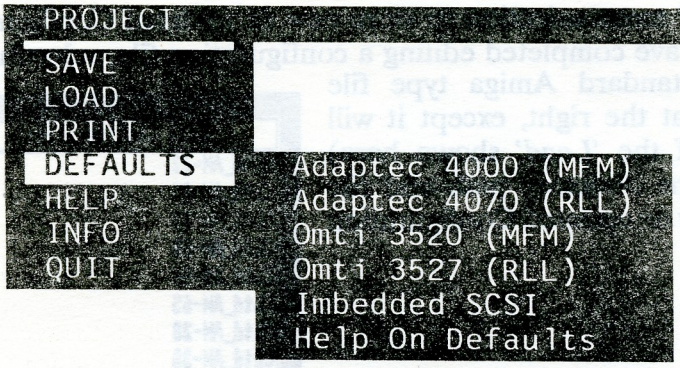
If the Hard Drive you are using was formatted at the C Ltd. factory using SCSIdos_3.0 (one indication of this would be that the serial number of your Hard Drive is hand-written on the label of the SCSIdos_3.0 Boot Disk) there will be an entry for your drive that is complete and can be loaded using this menu selection. If however you are not using a C Ltd. Hard Drive, or your Hard Drive was factory formatted using a version of SCSIdos prior to the SCSIdos_3.0 release, there may be a Configuration File available for your drive, but it will contain no Bad Block (defect) List, so that information must be entered by you. If there is no Configuration File (be sure to scan the list carefully as it is not listed in any order whatsoever) for your Hard Drive, you will have to create your own. See the *'Defaults'* selection of this menu for information about creating a configuration file for your Hard Drive.

PRINT

Selecting this menu item will provide you with a printed (assuming that your printer is connected and on-line) permanent record of the current data from the FEdX program. It is advisable to retain a printed copy of the information in case some real disaster renders the stored data unusable.

DEFAULTS

When selected, this menu item currently displays six sub-menu items as follows:



NOTE: If additional controller types are added in future revisions of the FEdX program they will be reflected here.

With the exception of the 'Help On Defaults' sub-menu selection (which is self-explanatory) each of these selections represents one of the types of SCSI devices that can be Low-Level formatted. If you are using a C Ltd. Hard Drive, the following table provides the proper selection for each C Ltd. product:

Hard Drives for the A-500 and A-1000, and EXTERNAL A-2000 Drives.

Model Number	Selection
AM-20, AM-22, AM-24	Adaptec 4000
AM-33, AM-44, AM-50	Adaptec 4070
AM-33(high speed), AM-50(high speed)	Omti 3527
ALL OTHERS	Imbedded SCSI

Internal Hard Drives for the A-2000 are typed by the SCSI Host/Controllers used.

Part Number	Selection
SCSI/2000	Imbedded SCSI
SCSI/2506M	Omti 3520
SCSI/2506R	Omti 3527

After selecting one of the five Sub-Menu items, a new window will be opened on top of the FEdX screen which will allow you to select the exact drive that you are using.

We have supplied ***default*** configuration files for most major brands of SCSI Hard Drives, as well as for many ST-506 type Hard Drives in combination with either Adaptec or Omti SCSI to ST-506 Hard Drive Controllers. These ***default*** configuration files are in the *'FmtData'* drawer on the C Ltd. SCSIdos_3.0 **Utilities** Disk, and can be selected from the *'Defaults'* selection window which opened by selecting one of the *'Defaults'* sub-menu items. You may locate, select and load the configuration file for your drive from the defaults window. (The configuration file names will directly specify the Hard Drive and/or SCSI device controller, by both brand and model, to which the file will apply.)

HELP

When selected, this menu item activates the HELP mode of the FEdX Program. When the HELP mode is active, the mouse pointer changes to a special HELP pointer to inform you that you are in the HELP mode. To get HELP on any item on any FEdX screen or window, activate the HELP mode by selecting the HELP menu selection, then simply click on the item for which you need the help.

After selecting an item for help, a HELP screen will be displayed which will provide instructions, sample or preferred entries or other information relevant to the item in question. At the bottom of the HELP screen are two gadgets marked ***MORE HELP*** and ***EXIT HELP***. Selecting the ***MORE HELP*** gadget will close the HELP screen, but keep the HELP mode active, thereby allowing you to get additional help information by selecting additional items. Selecting the ***EXIT HELP*** gadget will close the HELP screen, de-select the HELP mode and return you to the FEdX main screen.

INFO

Selecting this item will cause a screen to be opened which will display information about the FEdX program. The information displayed will include the version number of the program and the names of the authors of and other contributors to the FEdX program.

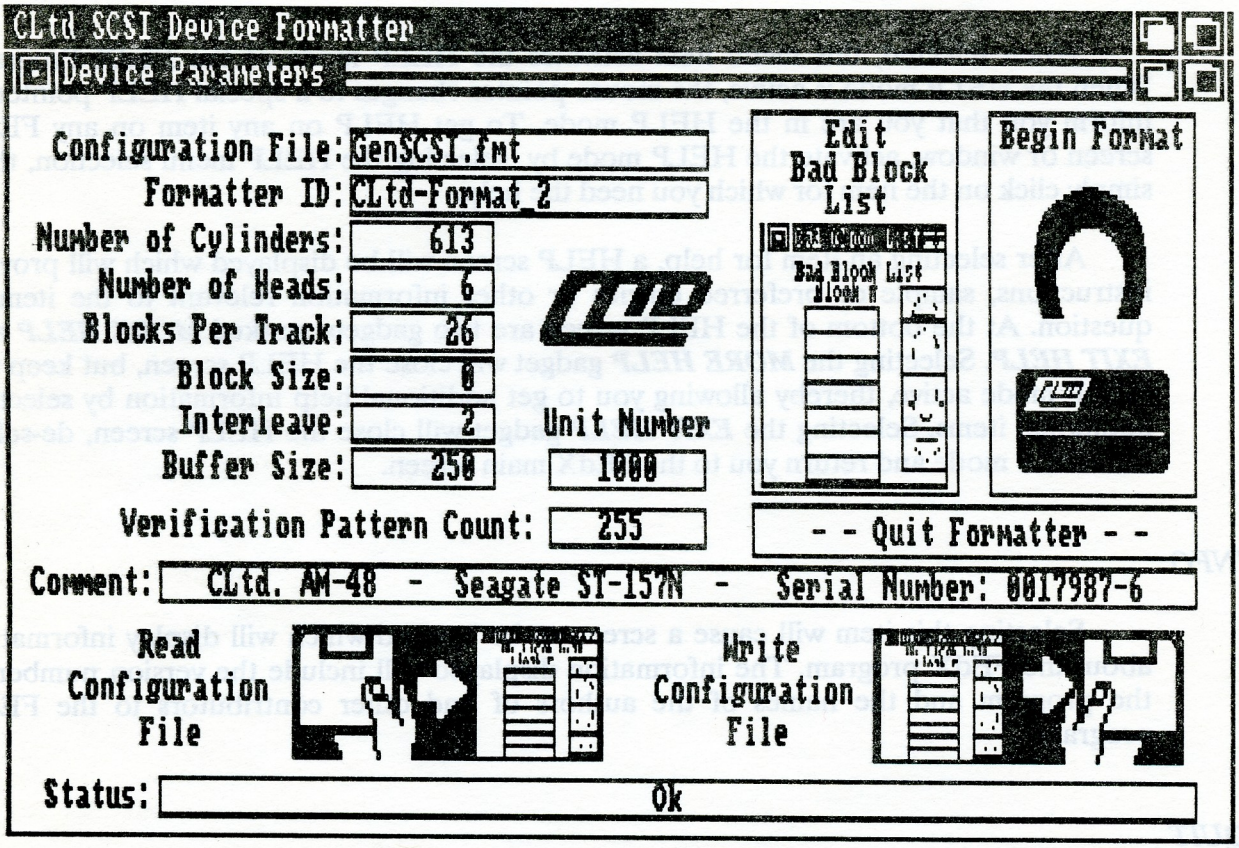
QUIT

Selecting this item will quit or exit the FEdX program. (This can also be accomplished by clicking the 'Close Window' gadget at the top left of the FEdX screen, or by selecting the 'Quit Formatter' function icon.)

NOTE: If there have been any changes made to the FEdX configuration data, be sure that you save the updated Configuration File. The program will require you to save the file prior to beginning the format process, but will not do so if you quit the program without actually formatting your Hard Drive.

The FEdX Main Screen

The FEdX main screen (as shown below) has eleven boxes, called *'Text Entry Boxes'*, for you to enter the information needed to properly format your Hard Drive, five selection icons, called *'Function Icons'*, that will call up specific functions and one status line that will provide you with status information as you enter data and perform various functions. Each of these items will be described below, starting with the eleven *'Text Entry Boxes'*.



The FEdX Main Screen

The Text Entry Boxes

The eleven text entry boxes (actually these are string gadgets) will contain the information that the FEdX program needs to know about your hard drive so that it can be properly formatted. If a *'default configuration'* is selected from the 'defaults' section of the project menu as described above, the values from that selection will automatically be loaded into the text entry boxes.

Configuration File:

This field should contain the name of the Configuration File to be used by the Low-Level format routines for the specific type of Hard Drive being formatted. This entry will be determined automatically by the FEdX program using information from the Configuration File or the Defaults File.

Formatter ID:

This field must contain the name of the actual Low-Level formatting routine to be used to format your Hard Drive. There are currently four Low-Level formatting routines:

CLtd-Format_0 is used with all Adaptec SCSI/ST-506 device controllers;
CLtd-Format_1 is used with all Omti SCSI/ST-506 device controllers;
CLtd-Format_1 is also used with most imbedded SCSI Hard Drives;
CLtd-Format_2 is used with Seagate imbedded SCSI Hard Drives;
CLtd-Format_3 is used with Rodime imbedded SCSI Hard Drives;

If additional format routines become necessary they will be added in future revisions of the FEdX program.

Number of Cylinders:

This field should contain the total number of cylinders available for formatting. (As per the manufacturer's specifications.)

Number of Heads:

This field should contain the total number of read/write heads that the hard drive uses for data storage. This number should not include any heads used for exclusively sync or servo purposes. (As per the manufacturer's specifications.)

Blocks Per Track:

This field should contain the number of formatted data blocks of the size specified in the next entry (*'Block Size'*)that are contained on each track. (Note: In the case of imbedded SCSI Hard Drives, this value will be specified by the Hard Drive's manufacturer, but for ST-506 Hard Drives that use external SCSI to ST-506 device controllers, this value will be specified by the SCSI to ST-506 device controller's manufacturer.)

Block Size:

This field should contain the size, in bytes, of each data block to be formatted.(As per the manufacturer's specifications.) **Note:** Only block sizes of 512 bytes and 256 bytes are currently being supported, and as of this writing, only the IOmega Bernoulli Box requires the 256 byte block size.

Interleave:

This field should contain the desired interleave as specified by the user. If a default configuration file is available for your drive, the value contained in that file will generally be the optimum value for your drive. (See the detailed explanation of interleaves in the SCSIdos_3.0 Technical Reference Manual.)

Buffer Size:

This value reflects the buffer size (in 512 byte increments) that will be used by the formatter for data storage during the write/read/verify operations. The *Buffer Size* value is only used during the formatting of the hard drive, and is provided so that users can format very large drives on small memory machines, and/or run other (multi-tasking) operations during the formatting process. The larger the buffer the faster the format.

Unit Number:

This value refers to the UNIT NUMBER (as contained in the MOUNTLIST and is equal to the Unit Number of the DevSetup file Units entry that is referenced by the MountList) of the SCSI device to be formatted. The UNIT NUMBER referenced here **IS NOT** the same as the SCSI address or SCSI unit number of the device!

Verification Pattern Count:

The value in this box tells the Low-Level formatter how many different data pattern surface tests it should run in its attempt to locate surface defects (bad blocks). There are several different sets of data patterns that can be written, read and verified in order to more completely test your Hard Drive and the value entered here sets the number of different test patterns to use, this is not the same as the number of times that one simple test is done. Legal values are 0 to 255, however in most cases the largest number of available test formats is seven. If you set the value to > 16 the formatter will automatically do all available tests that can be performed on your drive which, in turn, will provide you with the highest possible reliability. Be aware, however, that each verification test takes a substantial amount of time and in some cases you may wish to use less tests. For example if you are re-formatting for the purpose of trying different interleave values to see which one is the fastest, it would be quite reasonable to set this value at 0. Normally, however you should use at least the minimum recommended value of 3.

Comment:

This area is unused by the formatter and is reserved for your use, the comments are stored with and become a part of the configuration file for your drive. It is recommended that you put the brand, model and serial number of your Hard Drive. By putting this or similar identifying data in this area, you can easily differentiate this configuration file from others which may be intended for use with other Hard Drives on your system, or even older versions of the configuration file which are no longer being used.

The FEdX Function Icons

The five function icons (actually called BOOLEAN GADGETS) allow you to perform their specified functions by simply clicking in the icon. As shown in the graphic at the right, the five (highlighted) function icons are, Edit Bad Block List, Begin Format, Quit Formatter, Read Configuration file and Write Configuration File. The functions of these five icons are described as follows:

The 'Edit Bad Block List' Icon

Clicking in (ie. selecting) this function icon will enable the Bad Block List Editor which will allow you to manually ADD new entries to the Bad Block List, or to UPDATE existing entries in the Bad Block List. (For detailed information on the use of the Bad Block List Editor, see *'The Bad Block List Editor'* description a bit further on in this section.)

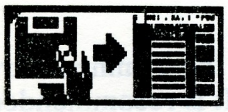
Begin Format

Clicking in this function icon will begin the actual Low Level formatting process. Be sure that you have entered all of the data required by the formatter before selecting this function icon. Before actually starting the Low-Level format procedure, you will be asked if you are sure that you want to format the drive and will be given an opportunity to abort the formatting process at that point.

Quit Formatter

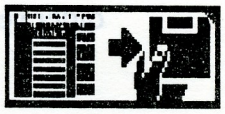
This function icon will exit the FEdX program without performing a format of the Hard Drive and without saving the current Configuration file. *'Quit Formatter'* performs the same function as the *'QUIT'* item in the Project Menu, and the close window gadget in the upper left of the FEdX Screen.

Read Configuration File



Clicking in this function icon will accomplish the same result as selecting the 'LOAD' selection from the 'PROJECT' menu.

Write Configuration File



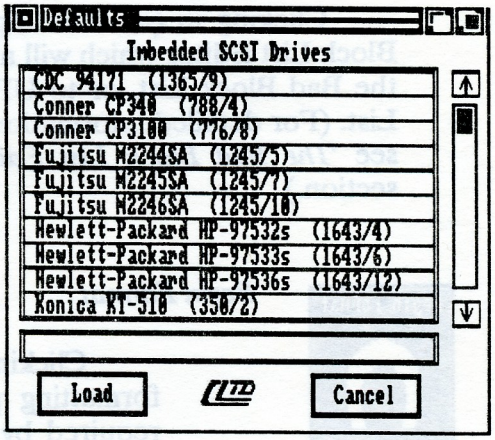
Clicking in this function icon will accomplish the same result as selecting the 'SAVE' selection from the 'PROJECT' menu.

The Comment Line

The only other object on the main FEdX screen is the STATUS: box. This area is used by the FEdX program to send messages to you about the progress of the FEdX program and to report any errors (ie. illegal or out-of-range values) that are encountered during entry of data into the text entry boxes.

The Default Selection Window

As stated (in the description of the *'Default'* Main Menu Selection) earlier in this section, when you select a sub-menu item from the Main Menu *'Defaults'* sub-menu, the Defaults Selection Window will be displayed on top of the FEdX Main Screen. The Default Selection Window will, as shown in the picture at the right, display a list of hard drives for which pre-defined default values are available.



The Defaults List:

The list of default Hard Drives displayed in the The Default Selection Window is sorted in alphabetic order using the name of the manufacturer of the Hard Drive. The list contains all of the model numbers of the Hard Drives available from each of these manufacturers about which we were able to get information. If your Hard Drive manufacturer's name, or the EXACT model number of your Hard Drive is not displayed in the list, please contact our customer service department for additional assistance. To select one of the default configurations from the list, simply click on the desired entry. When an item has been selected, it will change color and it will also be displayed in the box below the Default List.

LOAD

Selecting the LOAD gadget will load the values for the currently selected item from the Default List into the FEdX program.

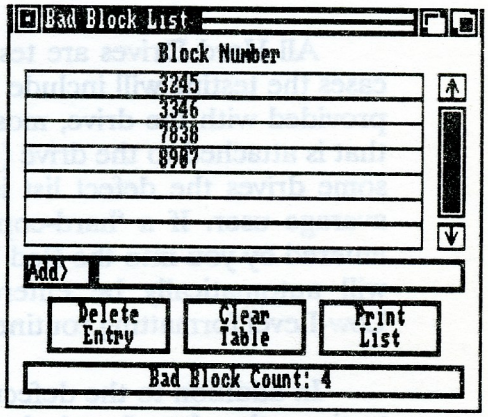
CANCEL

Selecting the CANCEL gadget will abort the default selection and return you to the FEdX Main Screen.

The Bad Block List Window

As stated (in the description of the *'Edit Bad Block List'* function icon) earlier in this section, when you select the Edit Bad Block List function icon, the Bad Block List Editor Window will be displayed on top of the FEdX Main Screen. This Window will display a list of defects that are known to exist on your Hard Drive.

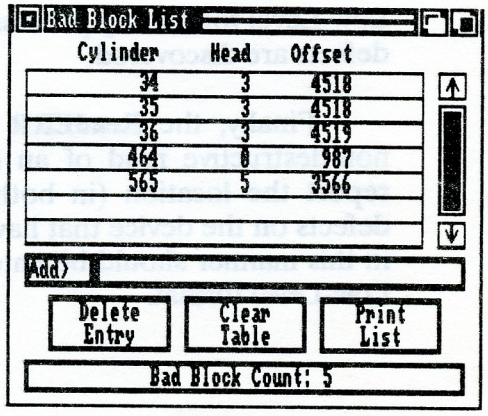
First, you should understand that almost all hard drives have some bad areas on the drive where data storage is impossible, or unreliable. This is a normal situation and you should not be upset if your hard drive has some defective spots. Additionally, it is possible that your Hard Drive may develop additional defective areas during normal (and abnormal) operations. Because bad areas do exist on most drives, all SCSI Hard Drive manufacturers provide a means of preventing these areas from being used for data storage, this is commonly referred to as *'mapping out'* bad blocks.



TYPE 0

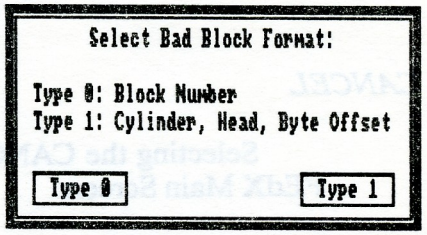
The Bad Block List:

There are two possible formats (shown here at the right as *'TYPE 0'* and *'TYPE 1'*) in which the FEdX program stores Bad Block Lists. If a Bad Block List is included in the Configuration File for your drive, the FEdX program will automatically determine which of the formats is to be used when you load the Configuration File. If there are no bad blocks in the Bad Block List, and if you DO NOT have a list of bad blocks provided to you by the manufacturer of your Hard Drive, the *'Low-Level Format'* program will automatically select the proper format for the Bad Block List. If, however, there are no bad blocks in the Bad Block List, but you do have a



TYPE 1

list of bad blocks provided to you by the manufacturer of your Hard Drive, a requester (like the one shown at the right) will ask you which of the formats you will be using. If the defect list supplied by the manufacturer of your Hard Drive lists defects by block number only, select the *'TYPE 0'* option. If the defect list supplied by the manufacturer of your Hard Drive lists defects in both block number and cylinder/surface/byte formats, or by cylinder/surface/byte only, select the *'TYPE 1'* option.



When the Bad Block List is displayed in the Bad Block List Window, it will look like one of the two versions of the list shown at the right. Notice that the top list displays three values on each line and that the bottom list shows only one. By far the vast majority of Hard Drives will use the top format which lists defects by their position on the drive in which the three numbers reflect Cylinder Number on which the defect exists, Surface on which the error exists and the Byte Offset (ie. bytes from the beginning of the track) where the defect is located. In the other case, the Bad Block List will simply contain the Sector Number where the defect was found. But in either case, the format to be used will automatically be selected for you by the FEdX program.

All Hard Drives are tested by their manufacturer prior to being shipped and in all cases the testing will include locating defects on the drive. In all cases the list of defects is provided with the drive, most manufacturers provide a printed or written list of defects that is attached to the drive (or on a sheet of paper that is shipped with the drive), but on some drives the defect list is stored on the drive and is therefore not available to the average user. If a 'hard-copy' list of defects is provided, the defects listed should be entered by you into the Bad Block List. If the list of defects is on the Hard Drive, the list will automatically be entered into the Bad Block List (during formatting) by the Low-Level formatting routines.

In addition to the defects located by the manufacturer of the drive during their final testing, the Low-Level formatting routines will test for any new or previously un-discovered defects during the formatting and verification process. Any additional defects found will automatically be added to the Bad Block List. At the completion of the Low-Level formatting process you will be prompted to save the new Bad Block List if any defects are discovered.

Finally, the **ReadERR** utility program provided on the Utilities Disk will do a non-destructive read of an entire (AmigaDOS formatted) device and will locate and report the location (in both block number and cylinder/surface/byte formats) of any defects on the device that have not previously been 'mapped-out'. Any defects discovered in this manner should be entered by you into the Bad Block List prior to preforming the Low-Level format.

Editing/Adding/Deleting to/from the Bad Block List:

Directly below the Bad Block List is the Bad Block List Add/Update Box, which is named appropriately for its two modes of operation, 'ADD>' and 'UPDATE>'. The Bad Block List Add/Update Box is normally in the ADD> Mode. The currently active mode can be determined by the presence of either the ADD> or UPDATE> prompt.

When in the ADD> Mode, the area of the Bad Block List Add/Update Box following the ADD> prompt is blank and ready for you to enter bad block information. To enter bad block information, use your mouse to click in the Bad Block List Add/Update Box which will put an active cursor in the box. Now you should type in the bad block information in the format required for your Hard Drive. In the Cylinder/Surface/Byte format, you should enter all three values with one or more spaces separating the values and then on pressing <RETURN> the new values will be added to the list. In the Block format, you should simply type in the block number and press <RETURN>. (Note: In both cases, the list is maintained in sorted order, so your entry will be inserted into the list in its proper position.)

To edit an existing entry in the Bad Block List, click on (select) the entry to be edited. The selected entry will change color to show that it is marked, the Bad Block List Add/Update Box prompt will change to UPDATE> and the value(s) for that entry will be put into the Bad Block List Add/Update Box. You may now edit the values and upon completion of your editing, pressing <RETURN> will put the updated values into the list, de-select the item and return the Add/Update Box to the ADD> mode.

Delete Entry

To delete an entry from the Bad Block List, click on (select) the entry to be deleted, then click in the *'Delete Entry'* gadget which is located below the Bad Block List Add/Update Box.

Clear List

To delete (or clear) the entire Bad Block List, click in the *'Clear Table'* gadget which is located below the Bad Block List Add/Update Box.

Print List

You may also want to keep a printed 'hard-copy' of your Bad Block List. Clicking in the *'Print List'* gadget which is located below the Bad Block List Add/Update Box will send the list to your printer. (Be sure that your printer is on-line and ready to print before selecting the *'Print List'* gadget.)

AmigaDOS Formatting Your Hard Drive.

This is the point at which you must make several important decisions. Unlike the Low-Level format program, the AmigaDOS Format program has a relationship with the information in the MountList File. (See MountList File) The AmigaDOS format program actually uses the information in the MountList File to determine the size and location of the area to be formatted, so the final formatted area will be exactly equal in size to the size indicated in the MountList File.

If you want to partition your Hard Drive, NOW is the time to make that decision. (See the section on Partitioning Your Hard Drive.)

This is the final step in preparing your hard drive for use. If you have gotten this far, you will be ready to run in a few minutes. The AmigaDOS Format program writes over any information on the Hard Drive (thereby clearing out any old data), with the Quick option, however, program only writes an information block containing the necessary DOS parameters. The AmigaDos Format program will take about 40 seconds per Megabyte to do its format, but the Quick option program will do the DOS format on any size partition in about .7 seconds! The AmigaDos Format program gets all (except for the disk's name) of its information from the MountList.

Formatting Using the AmigaDOS Format Program.

To use the AmigaDOS format program,

TYPE:

1> SYS:System/Format DRIVE DH0: NAME MyDrive [QUICK] [FFS] <Press Return>

Note: DH0: refers to the Device Name as used in the MountList File this may be DH1:, DH2:, etc., depending on the number of hard drives in your system. Also, MyDrive is the Volume Name and may be any valid name you want to call your Hard Drive by. For a complete explanation of the AmigaDos format command please refer to the AmigaDOS Enhancer 1.3 Manual.

After the format process is complete, you must mount your Hard Drive (see the Mount Command) with the statement:

1> Mount DH0: <RETURN>

NOTE: As before DH0: could be any Device Name in your MountList File.

Now you are ready to use your new Hard Drive. Your new drive will respond to either the Volume Name you gave it in the above format command (ie. MyDrive:) or the Device Name you assigned to it in the MountList File (ie. DH0:).

Updating to SCSIdos_3.0

NOTICE: If you are planning to upgrade to both **SCSIdos_3.0** and the AmigaDos 1.3 at the same time, **DON'T DO IT !!!!!!**

Trying to do both upgrades at the same time is simply too complex a task to be accomplished in one sitting. Please install AmigaDOS 1.3 first, then after you are running under 1.3 and everything is operational, please test it thoroughly for several days before attempting to install **SCSIdos_3.0.**

When you do get around to updating your system by implementing **SCSIdos_3.0**, we have provided an ***'Update_to_3.0'*** program on the **SCSIdos_3.0 Update Disk** that will do most, and in many cases all, of the update for you automatically. This program will transfer all necessary files and do most of the set-up necessary to update from older SCSIdos 2.xx revisions to the new revision **SCSIdos 3.00.** If you are currently using a revision of SCSIdos that is **older than SCSIdos 2.01** you **MUST** contact C Ltd. Customer Service for additional update information prior to attempting to install **SCSIdos_3.0.**

The **Update_to_3.0** program will copy all necessary files into the the proper directories and will attempt to modify your existing MountList to comply with the new format as used by **SCSIdos 3.0.** If successful, the program will also create the required **DevSetup** file. If your existing MountList is too complex, the program will not make any changes to your MountList, but will automatically put you into the **MLed** MountList Editor Program thereby allowing you to manually make the necessary corrections to your MountList and to create the required DevSetup file. (NOTE: A complete description of the use of the **MLed** program is provided starting at Page 35 of the **SCSIdos 3.0 Instruction Manual.**)

Before you start your installation of **SCSIdos_3.0**, there are a couple of things you should do in preparation for the update program. First, This program assumes that you are working on a BACK-UP COPY of your **CURRENT** Hard Drive Boot Disk, so start out by making a copy of **both** your current boot disk and the **SCSIdos_3.0 Update Disk.** Remember, the **Update_to_3.0** program will modify your boot disk, so please use only a back-up copy of your disk, not the original. Second, the **Update_to_3.0** program expects that the disk to be updated is named **SCSIdos_3.0**, so after making the BACK-UP of your boot disk, rename it as **SCSIdos_3.0.** (If you do not know how to make back up copies of disks or are unsure of how to rename a disk, please refer to your AmigaDOS manual.) And, finally, the **Update_to_3.0** program will require about 40K of space on your (newly re-named) **SCSIdos_3.0** disk. If there is not enough room on the disk for the addition of the **SCSIdos_3.0** files, you will need to delete some of the existing files from the disk prior to running the **Update_to_3.0** program.

(over)

Assuming that you are prepared as described above, you should start the **Update_to_3.0** program as follows:

1. Power-up your Amiga as normal, but when a WorkBench disk is requested, insert the **SCSIdos_3.0 Update Disk** in drive DF0:.

2. When your system is completely initialized, locate the **SCSIdos_3.0 Update Disk Icon** and double-click on the Icon to open the Disk.

3. As soon as the disk's contents window is open, locate the **Update_to_3.0** Icon and double-click on the Icon to start-up the **Update_to_3.0** program.

4. Follow the instructions on the screen and in a few minutes you will have completed the upgrade to **SCSIdos_3.0.**

5. After you have completed all of the steps in the **Update_to_3.0** program, simply re-boot your computer using the new **SCSIdos_3.0** disk as your boot disk.

6. Once your system is initialized using the new **SCSIdos_3.0**, it should initialize your hard drive normally, just as it did before the boot disk was modified.

7. Finally, activate a CLI window and type the following command to complete the conversion to **SCSIdos_3.0:**

1> Copy SCSIdos_3.0:devs to dh0:devs all <RETURN>

Your update to **SCSIdos_3.0** should now be complete, if you are experiencing any problems, please call our Customer Service department for any assistance that you may require.

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